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ORIGINAL ARTICLES.

THE TREATMENT OF HYPERTROPHIED TONSILS.

Read by title before the Section of Laryngology and Otology, at the Forty-second Annual Meeting of the American Medical Association, Washington, D. C., May 1, 1891.

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An enlarged tonsil may project beyond the pillars of the fauces without giving rise to any special subjective symptoms, or it may provoke serious disturbance and yet be invisible except during the act of retching. It may interfere with hearing, impede breathing, or obstruct swallowing, or it may simply be the cause of pharyngeal irritability or of various reflex disorders. The amount of functional derangement excited by an enlarged tonsil depends in part upon the relative dimensions of the faucial space and upon the temperament of the individual. Moderate hypertrophy in a contracted pharynx or in a neurotic subject may be the source of excessive annoyance, whereas an extreme degree of enlargement may be easily tolerated in a capacious pharynx or by a phlegmatic subject.

At the present day but few will be found to object to the statement that hypertrophied tonsils require to be reduced or removed, even in the absence of marked subjective symptoms. For whatever function these organs were intended it must be admitted that in their hypertrophied state they have become incapable of performing it, and are therefore useless appendages. Moreover, there is abundant clinical evidence to show that their presence invites contagion, and in the event of infection they become a serious complication.

For example, during an epidemic of diphtheria children with large tonsils are more prone to contract the disease and are apt to have it in a severe form. The old fallacy, as maintained by Ottenbourg,[1] that enlarged tonsils are a protection against croup, must give way to the modern and more scientific opinion that, even without having undergone marked increase in size, the tonsils may become avenues for the admission of disease to the system, in consequence of a condition described by Zawarykin[2] as "rarefaction of the epithelium." Its pathological importance has recently been verified by Hodenpyl,[3] who expresses the belief that "it has an important bearing upon the absorption of bacteria and their ptomaines and in the production of certain of the acute infectious diseases." Admitting, therefore, that diseased tonsils should not be ignored as of trifling consequence, we must answer the question as to the best method of treatment. So many elements are concerned that we may safely affirm that no one method is adapted to all cases. Those who cut every tonsil and look upon other methods as puerile and unsurgical, must often find their attempts at excision to some extent foiled by certain anatomical peculiarities, or by strenuous objection on the part of the patient. On the other hand, those who advocate the invariable use of cauterization not infrequently accomplish by painful and tedious methods what might be done in a few moments with equal safety.

The treatment of enlarged tonsils may be divided into medical and surgical. The former may be dismissed in a few words, since clinical experience shows that the hypertrophied tonsil yields slowly if at all to internal medication, except, perhaps, in struma or anæmia. In such cases hygiene, diet and tonics may have a limited influence. The same is true of local applications resorted to for the purpose of promoting absorption. In the majority of cases whatever constitutional defects may be present are directly attributable to the tonsillar hypertrophy, and are best remedied by removing the latter. Without wasting time in futile efforts to amend the systemic condition we should resort at once to surgical measures.

The following enumeration includes most of the methods which have been or continue to be practiced. Some of them have long since been abandoned, while others have never found favor except in the hands of their promoters:

1. Electrolysis.
2. Massage.
3. Chemical caustics.
4. Galvano-cautery puncture, or ignipuncture.

5. Avulsion with forceps.
6. Ligation.
7. Enucleation by means of the finger.
8. The cold wire snare.
9. The galvano-cautery snare, or amygdalotome.
10. Excision by means of scissors, the bistoury, or the guillotine.

1. Electrolysis: Interest in this method is not altogether lost, since we find within the past month a contribution to the technique of electrolysis in enlarged tonsils. A bifurcated needle electrode has been devised by Dr. Henry L. Coit,[4] and is said to facilitate the operation. The needle, which is inserted into the tonsil, carries the negative current, while the positive electrode is applied externally. The applications are made weekly, are painless and bloodless, and are supposed to promote "absorption of the fibrous exudation, without destroying the mucous membrane," whatever that advantage may be. At a recent meeting of the American Laryngological Association, during the discussion of a paper on the galvano-cautery in hypertrophied tonsils, Dr. T. A. DeBlois[5] stated that he had obtained good results with electrolysis, making half a dozen punctures each day. He uses it only in adults. Cohen[6] also mentions having used it successfully in certain cases, while in others the results were not worth the trouble. At best it appears to be very slow, and it would seem to be fair to question whether the other measures generally used in conjunction with the electrolytic treatment are not at least equally responsible for whatever slight shrinkage may be observed.

2. Massage is referred to by many writers, but it evidently has not been extensively used. Good results have been reported by Quinert,[7] who recommends rubbing powdered alum into the tonsil.

3. Almost all the agents in the list of chemical caustics have been at various times employed to destroy enlarged tonsils. Not more than three have proved of permanent value, namely: nitrate of silver (Holmes),[8] chromic acid (Donaldson)[9], and London paste (Mackenzie).[10] The first is most effective when passed into the lacunæ of the tonsil, the second is used after making small incisions, and the third is applied to the surface of the tonsil with a spatula. Several objections are common to all. Their action is slow and in some cases is limited with difficulty, so that they can be safely used only when we have the cöoperation of our patient.

4. The foregoing objection applies with less force to galvano-cautery puncture and ignipuncture. The application of these agents is much more precise, the immediate pain and the inflammatory reaction are certainly no more than with chemical caustics. In a tolerant patient much more rapid work may be done, nearly the whole tonsil sometimes being destroyed at a single sitting. In spite of the testimony of many recent writers (Saint Germain), I have not found that children submit quietly to this method of treatment, and even in adults, and with the free use of cocaine, a good deal of complaint is made. In my judgment galvano-cautery puncture is undoubtedly the best resource in those broad, flat, adherent and deeply embedded tonsils, which cannot be reached at all with the guillotine, and whose removal with the knife is more or less difficult and hazardous. Krishaber,[11] who is one of the most ardent advocates of ignipuncture, sums up his views as follows: It is not painful. It is attended by no complications and results are prompt. Its application is easy, and its use, except in rare cases, demands no extraordinary skill.

5 and 6. Avulsion with forceps and ligation are of historical rather than of present practical interest. The former seems to have been practiced in very early times, while the latter has been more recently advocated by Guillemeau and Moscati. In referring to the latter Krishaber remarks that it is dangerous because of the inflammatory reaction likely to ensue.

7. Enucleation by means of the finger was practiced by Celsus and it has been since his time occasionally used, probably more from curiosity than because it has anything to commend it. It seems to be easily performed, except when the attachments of the gland are unusually firm and dense. The contusion of the parts necessitated by removing a tonsil in this way would be likely to induce an excessive degree of soreness. (Bernardino,[12] Larghi,[13] Borelli,[14] Farmer.)[15]

8. With the cold wire snare (Jarvis)[16] primary hæmorrhage should not occur, provided the section be not too rapid, but there is always, of course, a possibility of secondary bleeding unless the usual precautions as to diet, movements of deglutition, clearing the throat, etc., are observed. In the few cases in which I have used it the process has been extremely painful, the tightening of the loop, as it gradually contracted upon the tissues at the base of the tonsil, became more and more difficult, and the subsequent distress of the patient was certainly excessive.

9. In the adult, in whom we may have cause to expect hæmorrhage, or who refuses to be cut, the galvano-cautery snare or Dr. Jonathan Wright's[17] ingenious adaptation of the electric current to the frame of the Mackenzie guillotine, will be found serviceable. Some dexterity is doubtless required for the successful manipulation of the snare, which is not the case with the electric amygdalotome. The latter is used precisely as if it were a cutting instrument. The most satisfaction will be found with these methods in protuberant tonsils from which the palatial folds are quite free.

10. In the large majority of cases excision is the operation of choice. In tractable cases the

knife may be used with safety, but it is difficult to see that it has any advantage over the guillotine. The latter, if properly handled, will give an equally good result, and is undoubtedly safer. Scissors are perhaps less dangerous than the knife, but must be more awkward to handle. Cohen seems to be almost the only authority who sees greater danger to the palatine folds in the guillotine than in the bistoury. The only cases of fatal hæmorrhage and, with but few exceptions, the only cases of alarming hæmorrhage have occurred after the use of the bistoury.

Leaving out of the question the condition of hematophilia, in which a cutting operation is of course contraindicated, we find four possible sources of hæmorrhage after excision of the tonsils: 1. Wound of an anomalous ascending pharyngeal artery. 2. Injury of an abnormally vascular pillar. 3. Section of the venous plexis sometimes found at the lower border of the tonsil. 4. An enlarged and patulous artery in the body of the tonsil itself. The first two may exist at any age, but are likely to be met with only when the bistoury is used rather than the guillotine. The third occurs only in adults, and the fourth is certainly not common before puberty. My own conviction is that the danger of hæmorrhage from any source has been grossly exaggerated, largely perhaps in consequence of the unfortunate fact that many of those in the habit of excising tonsils are not schooled in general surgery and are hence easily alarmed by the sight of blood.

In my experience it is not the vascular looking tonsil that bleeds. From such a tonsil the flow of blood may be at first profuse, but it is soon checked by the ready retraction of the blood vessels. It is the pale, fibrous tonsil of the adult and of advanced childhood which gives us trouble. And the explanation is obvious. A tonsil of this kind is characterized by large increase of its connective tissue, by which the blood vessels are held open. A clot forms with difficulty and possibly only on the approach of syncope, as the pressure from behind diminishes. The foregoing statement suggests a point as to the amount of tonsil to be removed. It has repeatedly been said that it is merely necessary to remove the projecting portion, with the expectation that the remnant will ultimately shrink. It is curious to notice the difference of opinion expressed by various authorities on this subject. In his monograph on hypertrophied tonsils Paul Balme[18] especially insists upon the importance of avoiding excessive outward pressure with the tonsillotome lest the pillar of the fauces be wounded and hæmorrhage follow. Amygdalotomy and not amygdalectomy, partial rather than complete excision is advised. Deroubaix[19] claims that but little more than the projecting portion need be removed. Seiler[20] says that "total extirpation or enucleation is also dangerous besides being unnecessary, except in the extremely rare cases of cancerous growth in the tonsils." Prosser James[21] remarks that a small portion sliced off is an effectual remedy, as the remainder of the tonsil shrinks within the pillar and the cure is complete! Philip Schech[22] claims that removal of the whole tonsil is unnecessary and dangerous; only the projecting part should be removed. Yet he admits the danger of wounding the carotid does not exist if the tonsillotome be used. Sir Morell Mackenzie[23] advocates partial removal, and Cohen[24] says that excision of the entire gland is "hardly ever requisite." He prefers the knife in adults, the amygdalotome in children. On the other hand, Lennox Browne[25] always endeavors to remove "as much of the gland as can be pressed into the guillotine," and does not look for atrophy of the rest. Bosworth[26] asserts that the "whole organ should be removed if possible in all cases." Examination of a large number of cases supports the belief that the stump of an excised tonsil does not, as a rule, shrink to an appreciable degree, but on the contrary remains as a source of irritation and is prone to recurrences of inflammation. In the second place, it is almost impossible to wound the pillar with a properly constructed guillotine, and, if that accident should happen, hæmorrhage, except under most extraordinary circumstances, could not be serious. Finally, and this is a point of no little moment, as much of the tonsil as possible should be removed, for the reason that deep section of the blood vessels through normal tissue permits them to contract so that spontaneous control of hæmorrhage is much more likely to occur. We can therefore accomplish a satisfactory excision of a tonsil only by strong outward pressure with the tonsillotome against firm support from without furnished by the hand of an assistant. As Mackenzie has remarked, this operation is almost the only one in our department requiring the exercise of brute force. There are two reasons, therefore, for making the extirpation of the tonsil as radical as possible: 1. Tendency to recrudescence is lessened; and 2, danger of hæmorrhage is diminished.

In conclusion, there are two points in connection with this subject which seem to me worthy of attention. One relates to the selection of an instrument, and the other to the use of anæsthesia. There seems to me no question that Mackenzie's modification of Physick's well-known guillotine is incomparably superior to all other instruments. Such accidents as have been reported by Schuler[27] and Barré[28] with the Mathieu tonsillotome could hardly happen with the Mackenzie instrument. The addition of a fork to the guillotine not only complicates the operation but adds to the difficulty of keeping the instrument aseptic. If properly managed the Mackenzie

tonsillotome will cut only the tonsil and in suitable cases it will remove as much of the organ as may be desired. This instrument commends itself, therefore, because of its strength, its simplicity, its safety, and its effectiveness.

There no doubt exists some prejudice against the use of an anæsthetic in removing tonsils. In the course of a discussion at the Paris Surgical Society, Reclus[29] referred to an unpublished case of fatal asphyxia during a tonsillotomy under chloroform. Avoid profound anæsthesia, remove the tonsils in quick succession, immediately turn the patient upon the face, and such a misadventure cannot occur. Some years ago Ingals[30] remarked that removal of the tonsils is as serious a matter for a child as it would be for an adult to be hung. In young children, therefore, we should use ether or chloroform, not only to obviate mental and physical suffering, but, what is much more important, in order to enable us to explore the naso-pharynx at leisure, and if necessary to remove from that region those collections of lymphoid hypertrophy so often associated with similar overgrowths between the palatine folds.

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LOCAL ANÆSTHESIA WITH THE PHARYNGEAL COCAINE SYRINGE.

Read by Title in the Section of Laryngology and Otology, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

BY JNO. E. BOYLAN, M.D.,

OF CINCINNATI.

Mr. Chairman and Gentlemen:—I had occasion to report last year, at Nashville, a method of effectually anæsthetizing the tissue of the vault of the pharynx before operating upon adenoid vegetations, by the interstitial injection of cocaine with a suitably constructed and guarded needle syringe. I wish to-day to make a brief report of observations with the instrument during the past year, and as it was incomplete when exhibited, and has since been somewhat modified, I take the liberty of producing it again. An objection raised to the use of the instrument, which was otherwise kindly criticized at the time, was the danger of calling forth alarming or even fatal symptoms by subcutaneous injections of cocaine.

Dangerous and disastrous results from the use of cocaine as a local anæsthetic was, from the start, the bugbear that stalked at the heels of this brilliant and most happy innovation, as it was upon the introduction of the general anæsthetics, chloroform and ether; and yet I should like to ask how many of the gentlemen present have found this objection a sufficiently grave one to have prompted them to desist from its use? Though we occasionally hear the note of warning, and here and there a fatal case has been reported, their proportion has not increased with the prevalence of the drug, while its use has become so universal, among the specialists particularly, that it is to be doubted if there are many of the latter who could now be induced to do without it. With the report of fatal cases we are almost invariably informed of the size of the dose administered, and I have yet to hear of a single one which was not much larger than necessary to produce satisfactory local anæsthesia.

Aside from the repeated applications to the mucous membrane of the nose and throat, made almost daily over a period of about four years, I have, since May last, injected cocaine into the tissue at the vault of the pharynx of thirty-seven different patients. I have never failed to make a note of cases in which symptoms other than local anæsthesia were manifested, and of these there are nine all told. In five of the nine cases, toxic or constitutional symptoms, such as hilarity, pallor, somewhat labored respiration or tendency to syncope, occurred after the application of about 30 m. of a 20 per cent. solution with a brush. The remaining four cases occurred after hypodermic injection, and as follows: The first three happened among the first ten cases treated, and following an injection of 20 m. of a 10 per cent. solution, or about 2 m. of cocaine, while the fourth was the only one which occurred among the last twenty-seven cases, after reducing the injections to 15 m. of the same solution, to which quantity they have since been confined. In only one of all the cases were the symptoms at all alarming. In this instance the patient was a robust boy 15 years of age, and the dose, which was injected with the syringe, was possibly a little more than 20 m. Within two minutes the patient became pale, and stated that he was growing numb and dizzy. He stamped about for a few minutes, slapping his hands and legs, which seemed to be rigid with cramp; his respiration

1 Medical Times and Gazette, May 1859, p. 517.
2 Anatom. Anzeiger, 1889, No. 15, p. 467.
3 Americal Journal Medical Sciences, March 1891, p. 257.
4 Medical Record, New York, April 3, 1891.
5 Transactions American Laryngological Association, vol. xi, 1889, p. 78. Note on the Galvano-Cautery in the treatment of Hypertrophied Tonsils, by Chas. H. Knight, M.D.
6 Diseases of the Throat and Nasal Passages, 2 ed., p. 233.
7 Arch. Méd. Belges, 1878, from Jour. de Méd. et de Chi. Prat. No. 12, 1878.
8 London Lancet, 1882, p. 798.
9 Cohen, Diseases of the Throat, &c., p. 233.
10 Diseases of the Throat and Nose, 1880, p. 68.
11 Ann. d. mal. de l'oreille, du larynx, &c., July 1880, p. 63; 1881, p. 124.
12 Ranking's Abstracts, 1862, p. 240.
13 Presse Méd. Belges, No. 10, 1862.
14 Gaz. Med. Ital. Prov. Sard., Dec, 30, 1861.
15 British Medical Journal, March 1884, p. 602.
16 Journal American Medical Association, vol. i., No. 1.
17 New York Medical Journal, Aug. 30, 1890.
18 Balme, De l'Hypertrophie des Amygdales, 1888.
19 Presse Méd. Belges, Nos. 31 and 38, 1863.
20 Diseases of the Throat, 3 ed., 1889, p. 247.
21 Sore Throat, 4 ed., 1879, p. 240.
22 Die Krankh. der Mundh., des Rachens und der Nase, 1890, p. 151.
23 Arch. of Laryngol., vol. iv, 1883, p. 145.
24 Op. Cit., p. 229.
25 Diseases of the Throat. 3 ed., p. 255.
26 Diseases of the Throat and Nose, 1881, p. 141.
27 British Medical Journal, March 12, 1887.
28 Union Méd., No. 48, 1886.
29 Journal of Laryngology and Rhinology, 1887, p. 231.
30 Transactions American Laryng. Association, 1887, p. 178.

became labored, the dizziness increased, and he insisted upon lying down to sleep. Some whisky, a current of fresh air from the open window, and friction, gradually rallied him from this condition, and within twenty to thirty minutes he was completely restored. A week later, an injection of exactly 15 m. into the same patient was followed by but slight pallor and somewhat accelerated respiration, which did not impede the operation.

As the result of the above, as yet, rather limited observations, I infer that the amount injected should be about one-half that which may be applied to the mucous membrane. I believe m. 15 of a 20 per cent. solution a perfectly safe quantity to inject, and I have never known such a dose to fail in producing within five minutes entirely satisfactory anæsthesia, so that the patient never complained of pain from the operation.

The chief points of advantage which may be claimed for this method of anæsthetization are, 1, that it greatly reduces the percentage of cases in which a general anæsthetic must be resorted to, by effectually benumbing the part; 2, the ease and celerity with which it is accomplished, for it is done in an instant, and regardless of the ordinary retraction of the palate, the guarded point being quickly inserted between the latter and the pharyngeal wall, if necessary; 3, the rapidity and completeness of its effect; and 4, the fact that no cocaine is swallowed or retained in the nose, which does not assist in producing anæsthesia in the pharynx. As obstructions of the lumen of the needle necessitated various trips to the instrument makers, this has been made to screw to the canula, and can easily be detached with a forceps and cleaned. The instrument is made by Tiemann & Co., of New York, and by Max Wocher & Co., of Cincinnati.

AN ABSTRACT OF PAPER ON CHRONIC CATARRHAL LARYNGITIS.

Read by Title in the Section of Laryngology and Otology, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

BY MARION THRASHER, M.D.,
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Chronic catarrhal laryngitis is a continuous passive inflammation of the laryngeal mucous membrane. Its etiology is multifarious. The most influential causes are nasal stenosis, liquor drinking, tobacco smoking, vitiated air, and an intemperate use of the vocal organs.

Nasal stenosis necessitates mouth breathing—an abnormal respiration, by which we have carried into the laryngeal cavity an air pregnant with dust, that soon begets an inflammatory process.

Chronic alcoholism produces an abnormal activity of the mucous glands of the mouth and fauces, which, during sleep, drops depraved excretions into the larynx, thereby producing a permanent inflammation.

Tobacco smoking causes to be deposited daily in the air passages the liquid alkaloid nicotina, which produces partial paralysis of the vasomotor nerves of this locality, and a resultant permanent injury to the mucous texture.

Vitiated air, in illy ventilated apartments, is one of the commonest causes of chronic laryngitis. Air reeking with noxious vapors poisons the delicate tissues over which it passes, fails in its mission of aerating the blood, and by its toxic reaction, superinduces a chronic hyperæmia of the respiratory tubes.

An intemperate use of the vocal organs in criers, speakers and singers, must of necessity produce chronic laryngitis. Mandl says, in singers and orators, the arytenoids and vocal cords are inflamed, while in drinkers and smokers, the inflammation exists in the epiglottis and aryglottic folds.

The pathological condition is always one of hypertrophy of the mucous membrane of the larynx. This is a diagnostic symptom, and is accompanied by all or part of the following symptoms: difficult nasal respiration, morning hoarseness, decreasing with the day, cough, disphagia, copious secretion and excretion, supplemented always by a feeling of uneasiness or discomfort—but by an absence of positive pain.

The prognosis of chronic laryngitis is favorable as to fatality, but usually unfavorable as to a permanent cure. For years, extending to a long lifetime, it may continue, with remissions and exacerbations, and not perceptibly affecting the general health. The difficulty in the way of a permanent cure, lies in a failure in keeping up a given line of treatment for a sufficient length of time. Both physician and patient may at first be enthusiastic, but as days, weeks and months go by, the enthusiasm wanes, the treatment is neglected or wholly ignored—or perchance a temporary abatement of the prominent symptoms had led them into the belief that a cure had been accomplished. We should not forget to impress upon the mind of the patient and his friends, that a chronic disease can only be successfully combated by chronic treatment.

The pathological factor is hyperæmia. The chronic inflammation of the laryngeal membrane has produced a permanent distension of the capillaries—oversecretion and supersensitiveness.

The treatment may be local, general, or both—guided by the etiology. No less an authority than Lennox Browne claims but little for constitutional treatment. The experience of most physicians will not agree with his. The treatment may properly be local, constitutional, or both. The exciting cause must be discovered and overcome. The diagnosis can readily be made with

the laryngeal mirror. If the etiology points to portal congestion, chloral hydrate would be indicated; if a syphilitic taint, mercury; if tuberculosis, iron and cod-liver oil; if glandular enlargement, one of the iodides. The necessity of constantly breathing pure air cannot be too strongly dwelt upon. Let the diet be light, digestible and nutritious. The plethora of gluttony should be guarded against. For the treatment of chronic laryngitis, I know of no one remedy so efficient as alcohol. Unlike many others, it is applicable in all cases, irrespective of cause. It is a local and constitutional tonic, acting not only beneficially on the lining membrane of the air passages, but also as a systemic stimulant.

Nasal stenosis is reduced, and as a rule permanently cured, by alcoholic inhalation. Pharyngitis is relieved, and the uvula—usually elongated in laryngitis—is rendered normal. Several cases of tuberculosis, well advanced, have been checked, in my practice, by alcoholic inspiration. Wearing a full beard among men, has been strongly recommended by some medical writers as a remedy, both curative and preventive, for chronic laryngitis.

A thermometrical sameness, secured either by latitude, altitude or artificial methods, must not be overlooked, as one of the most potential of the remedial agents—but by all means, let your treatment be measured by months rather than days.

THE GALVANO-CAUTERY IN LARYNGOLOGY, WITH CASES.

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The object of this paper is to produce evidence tending to show that the galvano-cautery, and especially the snare, is a decided addition to the armamentarium of the laryngologist, and the method entitled to legitimate recognition. As a rule it is condemned most loudly by those who have used it the least, basing objections on theoretical grounds, and in most instances the objections urged are, it seems to me, not well sustained by the facts, nor by personal experience.

The variety of cases in which I have used the cautery in laryngology with advantage, are hypertrophy of the tonsils, cancer of the œsophagus with growth protruding into the larynx, papilloma of the larynx and abscess of the larynx.

In regard to the cautery in removal of the tonsils, I have used this method for three years, and *no other method* for two years. In using the galvano-cautery it is of prime importance that we have a handle so made as to allow the operator to make or break the current at will, and to at the same time operate the windlass with the thumb. The Flemming handle, or some of its modifications, is the instrument preferred by the writer. It is equally important to have a current that will heat the wire quickly and at the same time be controlled by a rheostat. Platinum wire is the only material that can possibly give satisfaction; and some form of storage battery will be found most serviceable.

In removal of the tonsils it seems to possess the following advantages:

1. Consent of the patient, as there is neither cutting nor hæmorrhage.

2. Absolutely no primary hæmorrhage, although the probability of secondary hæmorrhage is probably not lessened.

3. Greater facility of application, especially in small hypertrophies, and in many children with small throats, where an instrument of larger size could not be easily applied.

4. Better results because of lessened tendency to return, and less absorption after the operation.

5. In large hard hypertrophies where hæmorrhage is feared and where the cold snare is recommended by some writers.

Some form of tonsil forceps is always needed to aid in raising the tonsil from its bed. The forceps of Fanenger and of Ingals I have found the most convenient and valuable.

In using this method in public and in private practice in about one hundred and fifty cases I have had no unpleasant results, and only one case of slight secondary hæmorrhage.

In the removal of growths from the larynx the cautery has the following advantages:

1. Perfect safety, as the current is *never* turned on until the growth has been firmly grasped by the loop.

2. A small instrument which when in the larynx allows one to obtain a more perfect view of the parts, thus facilitating greater accuracy.

3. Absolutely no hæmorrhage, thus allowing growths to be removed piecemeal at one sitting, which could not be done by any other method where hæmorrhage obscures vision.

4. In papilloma of the larynx where the base is thus cauterized there is, I believe, less liability to recurrence.

I would not be understood as advocating this method to the exclusion of others, nor as even intimating that it is applicable to all cases, but where any growth can be grasped by the loop I believe it to be the best method.

Case 1.—Miss O., 26 years of age, saleslady by occupation, general health good, consulted me three years ago for laryngitis. At that time there was an acute inflammation and the membrane in the inter-arytenoid space was thickened and showing some rugæ when patient phonated.

Consulted me again May 25, 1891. At this time the patient could only whisper and she in-

formed me that she had not been able to speak aloud for several weeks, and that for over a year she had been always hoarse and much of the time completely aphonic, and that she is growing constantly worse notwithstanding almost constant treatment by various physicians. She says there is no pain in or about the throat, but complains of a tired feeling after attempted speaking. There was no swelling of the glands on the outside of the neck.

Family history reveals the fact that one sister died of pulmonary tuberculosis. Patient is large, strong, well nourished and has normal temperature.

Laryngoscope examination shows a general subacute laryngitis, and also reveals a rough, irregular growth of a slightly opalescent color apparently very nodular and occupying the interarytenoid space, and being separated into two lobes by a perpendicular fissure. It was almost a half inch in length from above downward and smaller in a transverse direction, and by its size and location mechanically prevented the approximation of the vocal cords by contraction of the arytenoid muscle, thus rendering phonation impossible. I informed the patient that I had never seen such a growth in that location, but supposed it was papilloma, but that a positive diagnosis could be made only by a microscopical examination, or noting whether the growth recurred, and advised removal. This was consented to and the galvano-cautery was the method chosen.

After a thorough application of cocaine (10 per cent. solution) I passed the loop into the larynx and after a few moments of patient manœuvering I succeeded in getting the loop firmly around it, and it was quickly removed without pain or hæmorrhage. On inspection I was not quite satisfied with the appearance of the base, so I then introduced another form of electrode and cauterized more completely the surface from which the growth had been removed. After the operation was completed the patient could speak aloud but was somewhat hoarse.

Unfortunately, just as I was removing the loop from the mouth the growth became detached and fell into a jar containing some blood, several quarts of water and masses of adenoid vegetation just removed, and I was therefore unable to secure and examine the specimen.

The treatment after the operation consisted in rest of the voice for one week. Morphæ gr. one-eighth the first night. Locally, iodoform in glycerine 10 per cent. applied once each day with cotton on applicator.

There was a little increase in inflammation on the day of the operation, but on the second day the inflammation had decreased and from that time on the improvement was rapid and the patient began work as saleslady at the end of the week, although I objected to her doing so. The second week I applied each day a spray of silver nitrate, 15 gr. to the ounce; the third week the same solution every second day.

The inflammation has now quite disappeared, the voice is as good as ever in her life and she is able to sing fairly well and that for the first time in nearly four years. Of course it is too early in the case to make a diagnosis, for it may have been tuberculous papilloma; but no one will deny, although all do not appreciate fully the value of radical treatment in these cases, and this is especially true if they are tubercular.

Case 2.—Mr. X., laborer, about 28 years of age, strong, robust young man, was sent to me last winter by Dr. Frank Cary. History of severe cold and sore throat.

Laryngoscope examination showed large abscess of the larynx. After applying cocaine, I evacuated with guarded lancet; considerable choking and coughing. Next day the abscess had refilled. I then introduced a cautery electrode in the place of former puncture and thus formed a round opening with some destruction of tissue, hoping thereby to facilitate drainage. I then washed out thoroughly with peroxide of hydrogen. There was no further refilling and the patient made a rapid recovery.

Case 3.—Mr. W., 50 years of age, small stature, emaciated, consulted me in October, 1890, on account of difficult deglutition. He informed me that he had experienced an increasing difficulty in swallowing, and at that time it required constant effort for over an hour to swallow a cup of coffee, and that no solid food had been taken for several weeks. He said he must get relief very soon or else die of starvation, and his appearance justified the statement.

Inspection of the outside of the throat revealed the fact that in the act of deglutition the larynx did not ascend to the normal extent, and that it seemed bound down and was less freely movable than normal. There was no infiltration of glandular structures in the neighborhood. The patient was free from pain and the family history was good.

On making a laryngoscopic examination, a large lobulated growth of a whitish opalescent appearance was seen apparently springing from the œsophageal opening, and acting as a valve, while one of the larger lobes projected forward, between the arytenoids, and appearing to prevent the epiglottis from closing the larnyx completely in deglutition, and seemed to explain why the fluids, as he expresses it, "went the wrong way" and "choked him."

I applied a 10 per cent. solution of cocaine to the entire larynx and, after about six minutes, made a more thorough examination with the probe, and found the growth to spring from the posterior wall of the œsophagus, immediately be-

hind the larynx. Thinking that possibly the growth, by its size and location, mechanically prevented the entrance of food, I determined to remove it. This I had no difficulty in accomplishing, using the galvano-cautery snare, removing it in four pieces, there being neither pain nor hæmorrhage during the operation. There was no reaction of any consequence subsequently. On attempting to pass a bougie into the œsophagus, I found a stricture at the upper part, although deglutition had been somewhat facilitated by the removal of the growth.

Microscopic examination revealed the fact that the growth was a ring-shaped carcinoma. After this time I dilated the stricture about every five days and twice each day I passed the stomach tube, giving the patient each time nearly a quart of milk, together with two eggs. Sometimes peptones were added instead of eggs, and for the last two months an ounce of brandy was given with each feeding, at the patient's request. For a short time the patient gained somewhat in weight, and quite materially in strength, going about the city freely and seemingly happy, and he said free from pain. At home he took some coffee and occasionally a little soup or broth. This treatment was continued for several months, when the patient died.

One interesting and troublesome feature of the case might be mentioned. From first to last it was impossible to introduce the stomach tube without the aid of the laryngoscope, thus necessitating personal care of the patient.

There was no return of the growth in the laryngeal cavity but the extension was downward.

70 State Street.

FRACTURE OF THE THYROID CARTILAGE.

BY GEORGE L. MORGENTHAU, M.D.,
OF CHICAGO.
ASSISTANT AT PROFESSOR SCHNITZLER'S POLICLINIC FOR DISEASES OF THE THROAT AND CHEST, VIENNA.

Since Arbuthnot Lane[1] (1885)drew the attention of the profession to the frequency of fractures of the hyoid bone and larynx, several cases have been reported which tend to confirm his statement, that these fractures sometimes produce such light symptoms that they can be overlooked. Formerly, the prognosis was considered much graver. Gurlt[2] had (in 1864) collected 68 cases, of which 47 ended fatally, and only 21 recovered. Even excluding those in which the injury was caused by an attempt on the patient's life, or where some additional accident complicated matters, 21 died, and but 13 recovered. Fischer[3] pronounces every fracture of the larynx serious. Later observers, however, contributed statistics which are more encouraging. The most recent publication, by Sakolowski,[4] describes a severe case with recovery. In it will be found a summary of the literature on the subject, statistics, etc. Although the case I had occasion to observe is an uncomplicated one, or rather because it shows how exceedingly light the symptoms resulting from a fracture of the thyroid cartilage can be, I think it worthy of publication.

The patient, a fairly intelligent, robust artisan of about 40, came to Professor Schnitzler's department in the Wiener Allgemeine Poliklinik on account of hoarseness. On being questioned how long this had troubled him, he said that some three months ago, while bending over a balustrade, he was struck on the back of the head by a descending, heavily loaded elevator. His neck was pressed between the lift and the bar. He was immediately attacked by a coughing spell, expectorated a little pure blood, and became aphonic. There was no pain, but the swelling about the neck induced him to go home and make applications. The next day he could go to work again, hoarseness being the only reminder of yesterday's accident. It was the hoarseness on account of which he came to the Policlinic, not having found it necessary to consult any physician meanwhile.

While inspection revealed nothing abnormal in the anterior part of the neck, upon applying the finger to the angle of the thyroid cartilage, the left ala receded. By rubbing the two fragments together, distinct crepitus could be heard and felt. Further palpation showed that the left wing of the thyroid cartilage was fractured longitudinally, the line being slightly irregular, and about ⅛ of an inch from the angle of the cartilage. All other parts, especially the hyoid bone and cricoid cartilage, were examined carefully, but appeared unharmed. The condition of the interior of the larynx was as follows: The epiglottis was omega-shaped, slightly overhanging. Both ventricular bands were much swollen, but did not look angry. The vocal cords could not be seen. Even in phonation, only a little portion of the posterior ends could be perceived. During the act of phonation the ventricular bands approximated, apparently producing the hoarse voice. An accurate opinion of the lesions in the larynx cannot be formed. The mucous membrane must have been lacerated, since the accident was immediately followed by hæmoptysis. The rent in the membrane, however, could not have been long or deep, or emphysema would have set in. According to statistics, there is emphysema in most of the cases, sometimes extending to the extremities. Possibly, also, the anterior attachment of the vocal

[1] Arbuthnot Lane, British Med. Journal, March, 1885.
[2] Gurlt, Handbuch der Lehre von den Knochenbrüchen, ii Teil., 1864.
[3] Fischer, Deutsche Chirurgie, Lief. 34.
[4] Sakolowski, Berl. Klin. Woch., No. 40, 1890.

cords was severed, and they could not be seen because they could not contract, not only because they were hidden by the ventricular bands. Another interesting question (also from a medico-legal point of view in cases of assault), is why, in this case, the line of fracture was vertical, and in or near the centre. Gurlt's experiments demonstrate that vertical fractures are possible when the larynx is compressed antero-posteriorly, as in this case. Possibly, ossification in the cartilaginous tissue had advanced to just the line of fracture. And the absence of the youthful elasticity—due in turn to the deposit of bony matter—is a predisposing moment (Hoffmann[5]). To be sure, the elasticity is not so great as to protect the larynx against every injury by external force. Figures show that youthful individuals are not at all immune against fracture of the larynx, although partial ossification predisposes to injuries. As this patient is over 40 years, ossification has undoubtedly begun. According to Patenko's[6] observations, the elasticity is not diminished before the thirtieth year, and ossification varies very much, also, in regard to the region where it commences, and to its extension. Another explanation applicable in the present case is offered by Gurlt. When the line of fracture is to one side, this might be due to the suture which is formed by the ala of the thyroid and a narrow, thin cartilage sometimes found between the two wings.

The only indication in this case, at the time the patient came to the Policlinic, might have been the alleviation of the hoarseness. The fracture caused him no inconvenience excepting the hoarseness, which did not hinder him in his work. We could not, therefore, in conscience advise him to undergo an operation, although the case might be considered well adapted for sutures. There was no vestige, here, of the formation of a bony callus after three months, though Lane demonstrated a specimen in which bony union had taken place. Perhaps the increased irritation by the wire sutures might have proved a favorable factor in bringing about such a result. Even fibrous union would justify an operation in some cases. As to the advisability of using sutures, the opinions of surgeons are divided. Fischer reports that all kinds of wounds and injuries in the upper air passages have healed as well without sutures as with them.

Generally, tracheotomy has been performed when the surgeon was called in shortly after the accident. Threatening dyspnœa will make this operation necessary in the majority of cases. Besides, in fracture of the cricoid cartilage, the canula tends to immobilize the fragments (Clarac[7]). Both indications might be met, in fracture of the thyroid cartilage, by O'Dwyer's permanent tubes. Intubation ought certainly to be tried in appropriate instances. Adaptation of the fragments will often present great difficulties, either when done from without through the tracheotomy wound or an incision, or possibly from above by aid of forceps. Complete rest, ice-bags on the wound, and vapors, are certainly of great benefit. The case described proves that tracheotomy is not always necessary. After only a day's rest the patient returned to work, without ever experiencing pain, or any inconvenience excepting hoarseness.

Vienna, July 1, 1891.

[5] Hoffmann, Wiener Med. Woch., Nos. 44 and 45, 1886.
[6] Patenko, Vierteljahschr. f. gerichtb. Med. von Eulenberg, Bd. xli.
[7] Clarac, Gaz. des Hôp., September, 1890. (Int. Centralbl. f. Laryngologie, etc.)

A BRIEF COMMUNICATION ON NASAL VIBRATION (MASSAGE) WITH REPORT OF CASES.

BY NORVAL H. PIERCE, M.D.,
OF LONDON, ENG.

At the Tenth International Medical Congress a paper was read before the Laryngological Section, which at once attracted attention, first, because it sought to introduce a novelty into our therapeusis; secondly, because it had for its scope and promise the cure of a class of diseases which have been regarded as nearly or altogether incurable. I refer to Dr. Brown's paper on Vibratory Massage of the Nose,[1] etc.

In order to refresh the memory of the reader I will take the liberty of presenting an extract translation of the above mentioned contribution.

The two massage movements employed are known according to Dr. Kellgrew (London) as effleurage and vibration.

By *effleurage* is meant a *stroking* movement superficial or deep, the force of which varies from a scarcely perceptible touch to distinct pressure.

By *vibration* is meant a light, rapid trembling movement, having its origin in the elbow joint and which is transmitted by the palmer ends of the fingers to the point of operation. The motions occurring in the relaxed wrist joint are abduction and adduction, while the hand itself remains in uninterrupted contact with the surface operated upon. The whole procedure is characterized by a lightness, rapidity, and elasticity of touch. The number of vibratory movements varies from 200 to 300 per minute.

In order to apply this treatment to the nasal cavities, a copper sound is necessary. The one recommended measures twenty cm. in length, and has a diameter at the larger end of two mm. The end which is introduced into the nose is finished with a ribbed head to which cotton may be attached. This cotton may be immersed in

[1] Massage, beziehungsweise, Vibrationen, der Schleimhaut der Nase, der Nasenrachenrauns und des Rachens. Dr. Michael Braun, Triest, Oestreich.

various medicinal solutions hereafter to be specified. The sound is held in the hand like a pen —i. e., between the thumb and first and second fingers—and the vibrations carried on as above described.

First, the floor of the nose is vibrated, then the inferior meatus and turbinated body, then the middle and superior, along their entire length, after which comes the septum. The Eustachian prominence may also be treated in the same manner, as well as the orifice of the Eustachian tube itself.

The number of fresh sounds used in a single case varies. In a late letter which I received from the author he says that he uses as many as twenty in one séance.

Strict cleanliness must be observed; all encrustations and discharge must be carefully removed and the vibrations carried to every part of the nose that is reachable. The vibrations last from one-half to sixty seconds, according to the patient's power of resistance.

Various solutions are recommended to be used in connection with the treatment. If there is hypersensitiveness the nasal mucous membrane is first painted over with a 20 per cent. cocaine solution. Subsequently the following medicaments may be used: 10 per cent. menthol vasaline ointment, 10 per cent. iodo-glycerine (iodine 1.00, kalium iodid. 1.00, glycerine 10). Sublimate (1 pro mil), lanolin, vasaline, balsam of Peru.

Dr. Brown has treated 1,000 patients by this method of treatment, and the most various nasal pharyngeal and laryngeal diseases have been comprised within this number. Perhaps the most striking results were obtained, it is said, in fœtid atrophic rhinitis. The disease very soon loses its fœtor, and the mucous membrane is restored to its normal condition, while the *atrophic turbinated bodies return to their normal proportions.*

In order to test the efficacy of this therapeutic mode, six cases of fœtid atrophic rhinitis were selected from Dr. Ottocar Chiari's ambulatorium at the K. K. Algancinca Krankhenhaus in Vienna, and placed under my care. These cases were carefully and conscientiously treated every day, with the exception of Sundays and holidays, for two months. At the end of that time I was called away by other duties, but the treatment was carried on for two more months. The directions given by Dr. Brown were carefully observed. Before the vibrations were commenced each patient received a thorough nasal douche or bath of one-half per cent. carbolic acid sol. and the nose was carefully inspected to see if any secretion or crusts remained. If so they were removed by the dry pledgit. The cotton with which each vibration was carried on was first immersed in iodo-glycerine sol.; each sèance lasted from twenty to sixty seconds.

Following is a brief summary of the cases with the results obtained:

March 2, 1891.—C. S. aged 29. The patient came to the ambulatorium in the middle of September, 1891. She was then suffering from advanced atrophy of both inferior turbinated bodies, accompanied by profuse secretion and formation of fœtid crusts. For two months from entrance the patient received a daily douche of one-half per cent. salt solution, and the nasal mucous membrane was painted with iodo-glycerine, which treatment was followed by a decrease in the amount of secretion. The vibrations have been carried forward since the middle of October. The patient says the discharge from the nose is much improved, but we can see no change in the atrophic condition.

M. P. aged 26. Patient complains that for three years a disagreeable odor has tainted her breath, and that she has had a profuse nasal discharge. Inspection disclosed marked atrophy of the lower turbinated body of the left side, and formation of crusts. Since the middle of November the patient has had nasal douche three times daily, and once a day penciling with iodo-glycerine. Under this treatment the fœtor diminished, together with the crusts, but the secretion was never altogether absent. Since November the vibrations have been employed. At this time the secretion is very slight in quantity, but there is no appreciable improvement in the atrophy.

S. A. aged 23 years. Patient has been treated since September with nasal douche and iodo-glycerine. She suffers from advanced atrophy of both inferior turbinated bodies; the right is the more advanced. Foul smelling crusts are also present. Vibrations since November. The secretion is improved more under this treatment than under previous method. Atrophy unchanged.

C. P. æt. 15. Patient has been a year at the clinic suffering from rhinitis atrophica. The inferior turbinated bodies entirely disappeared, and only a small portion of the middle ones remain. There is fœtor, profuse secretion and formation of crusts. The treatment has been nasal douches and penciling with iodo-glycerine until November, 1890, when vibrations were commenced. The odor and crusts formation have disappeared. The atrophy, however, is unchanged.

M. L. æt. 14. Patient has been coming to the ambulatorium for a year. There is atrophy of left lower and middle turbinated bodies, much secretion, crusts and odor. Before commencing the vibrations the treatment was much the same as that employed in the other cases, but the former has not proved superior to the latter. The atrophy is unimproved.

N. A. æt. 20. Patient complains of having

had a disagreeable odor from the nose for a long time. Inspection shows atrophic rhinitis. Patient has taken nasal baths at home for some time. Came to clinic in January, 1891. The vibrations in this case were followed by entire disappearance of the fœtor and diminition of secretion, but the atrophy remains unchanged.

From these cases and results we may draw the following conclusions:

First—To the cleanliness which is made so essential in this mode of treatment, are due most of the speedy cures or reliefs of disagreeable symptoms, i. e., fœtor, secretion, etc.

Second.—The vibratory movements themselves may be indeed of some benefit, inasmuch as they are stimulating to the lymphatic and vascular system, but

Thirdly we must believe from the above results that the vibrations have little or no action in regenerating atrophic tissue.

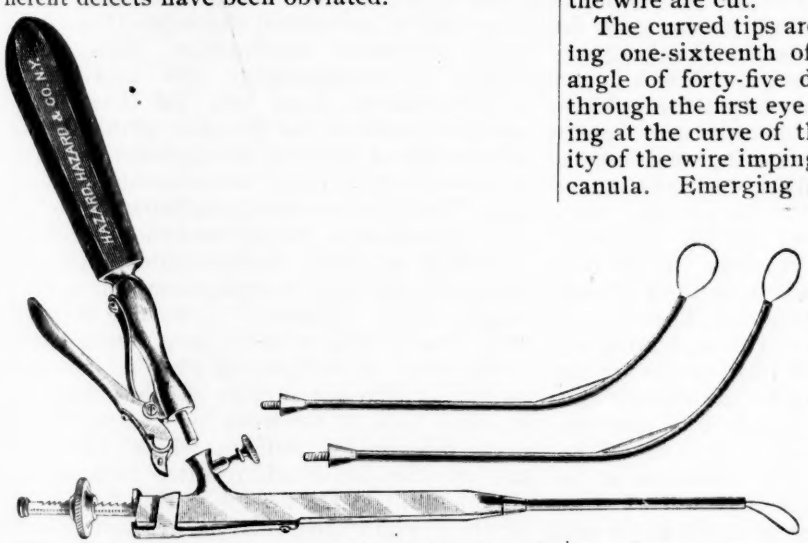
In conclusion I have to express my sincere gratitude to that eminent teacher, Dr. Ottocan Chiari, for his permission to publish these results as well as for many other kindnesses.

London, April 22d, 1891.

A NEW UNIVERSAL DOUBLE-ACTING SNARE.

BY CHARLES A. BUCKLIN, A.M., M.D.,
OF NEW YORK.

The good principles of all similar instruments have been combined in this snare, and their inherent defects have been obviated.



The wire is attached to a solid stylet, the objections to which are overcome by the powerful ratchet motion which draws it. A screw motion is also attached to the same stylet, thus enabling the operator to use a very slow-cutting snare, where hæmorrhage is feared, while the ratchet motion provides a rapid-cutting one where there is no reason to expect hæmorrhage.

The handle and ratchet motion may be detached at pleasure, leaving an instrument suitable for the slow strangulation of a very vascular growth.

The instrument has a straight tip for the nose and curved tips for reaching the larynx and naso-pharynx through the pharynx.

In curved canulas all attempts to use flexible stylets under severe traction are dangerous, as they must break sooner or later in making the transit of the curve.

With this wire écraseur every benign neoplasm or hypertrophy found in the nose, naso-pharynx or pharynx can be removed at a single sitting in a manner which commands the approval of the most conservative operator.

This instrument also fully meets all the requirements met by Stoerks' laryngeal guillotine or wire écraseur, and furnishes one not provided with laryngeal forceps with a simple and effective means of extracting many foreign bodies which lodge in and about the larynx.

If the instrument is firmly secured at the detaching joint, the wire properly fastened, and the clearances of the ratchet under-strain are $\frac{1}{32}$ of an inch, it will never fail to cut any growth the loop embraces.

The straight canula is armed with wire by passing it through the eyes of the slightly projecting stylet from opposite sides. The required loop having been formed, the stylet is drawn by the ratchet motion, and the projecting ends of the wire are cut.

The curved tips are armed with wire by bending one-sixteenth of an inch of the end at an angle of forty-five degrees. It is then passed through the first eye of the stylet into the opening at the curve of the canula, with the convexity of the wire impinging on the concavity of the canula. Emerging sufficiently to form a loop, it is returned through the curved canula, with its convexity impinging on the concave surface of the canula. When the wire appears at the opening, it is twisted until the bent point is opposite the second eye in the stylet, which it will enter easily, and the loop is complete.

By the pressure of the thumb on the tip of the instrument, the wire loop, after having been drawn, can be returned instantly to position for further operation through any of the tips.

For further particulars and history of steel wire snares, see New York *Medical Record*, July 4, 1891.

THE STERILIZATION OF MILK AND THE STATUS OF OUR KNOWLEDGE UPON THIS SUBJECT.

Read in the Section of Diseases of Children at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

BY HENRY KOPLIK, M.D.,
OF NEW YORK.

In presenting this subject, I feel that I am going over ground well elaborated before me, yet even in the face of this, it is somewhat surprising to find the lack of systematic idea entertained by physicians upon the subject of milk or its sterilization. This most important innovation upon infant feeding has, even in our journals, been granted faint praise in occasional paragraphs.

Though the work done thus far in this field has been most painstaking and scientific, it has not fully reached those for whose benefit these investigations are mostly undertaken,—the medical public. There are scattered through the French and German literature some very classical articles upon this subject, but no English writer has of late attempted to systematize and classify the ideas presented. If this article will deal with some scientific and abstruse data, it will endeavor to bring these in direct relation with our daily practice and therapy. For a long period past, the author has been going over old and recent ground, and this paper will endeavor to formulate the landmarks of our knowledge in this field.

Milk as it exists in the udder of a healthy cow is devoid of bacteria, as is also that of the human subject; germs of an offending nature reach the milk after it has left the animal. Speaking only of healthy animals and their milk, it is a matter of daily observation that various samples of milk will contain varying quantities of foreign matter, due, no doubt, to varying conditions of cleanliness at the first dairies. Soxhlet and Renk called attention first to the palpable detritus to be found in milk, and this has been often confirmed by my own observations. Aside from straw or dirt from the hands, if milk is allowed to stand in large quantities, small black specks may be seen at the bottom of the containing vessel, if this be glass. These small specks are manure from the udder or teats of the animal; thus it is easy to see how even healthy milk may contain very obnoxious elements. Renk found that different dairies varied in this respect as to the quantity of sediment. Here, in New York, I am happy to say that with care, we can obtain a milk moderately free, though not entirely so, from these elements; but in large quantities (a year ago) I have during the summer season seen these black specks in milk. Thus the bacteriology of milk must vary vastly with the varying amount of care or cleanliness with which the milk is collected,—and results of different authors will also vary, according to the source from which the milk is obtained. But the main principles are fixed, and can guide us in our practice.

If milk be allowed to stand at the ordinary temperature of the room either in summer or winter, it becomes "sour"—acid in reaction; there is a disturbance noticed in the consistency and appearance due to a precipitation or coagulation of the caseine elements of the milk and their separation from the fluid portion of the liquid. This is the acid fermentation of milk found under the normal conditions, and in ordinary milk, and was systematically studied by Pasteur, who described the "ferment lactique" or lactic acid bacillus as the cause and prime factor in this change. The rapidity of fermentation must vary with the temperature and varying conditions of bacteric invasion of the fluid. During the heated term, these conditions are presented at their best, and it is then that the above changes set in most rapidly.

In order to understand the true value of our present methods in dealing with artificially fed children, it is necessary to go over some historical ground, and I promise only to take you where my own studies and observations have led me.

The most admirable work of Hueppe upon milk, its decomposition by microörganisms, is known to you all. I will collect some data from this article first in my resumé.

As an example of the older doctrines upon the decomposition of milk, we may mention the views of Stahl, who writing in 1697, considered fermentation and putrid decomposition as analogous processes, fermentation being only a variety of decomposition. He assumed that in fermentation there was the formation of new combinations and the cause of the decomposition resulted from the transmission of molecular movement to easily decomposible combinations. The great advance in our knowledge of lactic acid fermentation, presupposes that once for all, lactic acid is a very characteristic combination, and on this ground, its separation from other decompositions. Scheele, in 1780, first discovered lactic acid in milk with its great resemblance to acetic acid. It will not aid us to go into a long resumé, so that our purpose will be subserved, if we next look at the work of Pasteur, who, in 1857, described a ferment which was always present when lactic acid resulted from sugar in organic fluids. He described this ferment minutely as small spheroidal bodies forming short links. With this theory of Pasteur, the lance was again taken up for the bacteric as against the chemical theory of fermentation. Later, 1858, Pasteur proved that in various fermentations if lactic acid be present and formed the lactic acid ferment was always present, although there were

numerous other and with difficulty isolated ferments. By excluding the air, his fluids remained unchanged, so that he concluded that the organisms were derived from the atmosphere and did not result from spontaneous generation. He found, what is important in relation to sterilized milk, that in spite of subjecting milk to a temperature of 100°, coagulation resulted, not with acid but alkaline reaction. There was no lactic acid ferment but "infusoria" (potato or butyric acid bacilli). At a temperature of 110 to 112° and 1½ atmospheres, there was a destruction of all life, no infusoria found, and no fermentation resulted. Failure to sterilize the milk was due not to spontaneous generation, but to the presence of a very resistant organism.

Schroeder and Pasteur came simultaneously to the conclusion that milk is difficult to sterilize, because it contains organisms which are very tenacious of life. But while Schroeder assumed that these organisms were present in the milk itself, Pasteur thought they were derived from the surrounding atmosphere. Pasteur first (1861) divided the butyric acid ferment from that of lactic acid, and minutely described the butyric ferment, which he called "Vibrio," and classified it among the infusoria (bacilli). The lactic acid ferment was also minutely described. Lister in 1878, established that the particular organism which he named bacterium lactis caused the acid fermentation of milk, and he by a method of dilution by which each drop of his fluid held a ferment germ, caused sterilized milk to undergo lactous fermentation with acid reaction; he described this organism also very minutely. He proved that other fluids, as water added to sterilized milk, caused other fermentations as butyric, but not lactic acid fermentation. Up to this time, the doctrine promulgated by Schroeder, Schmidt, Hoppe-Seyler, that though an organized ferment may cause lactous fermentation, yet under all circumstances, this was not necessarily the case, but that there were lactous fermentations dependent upon a chemical ferment preëxisting in the milk and derived from the mammary gland.

W. Roberts, in 1874, succeeding in retaining milk drawn from the breast into glasses free from fermentation, and Lister and Cheyne had similar results. Meissner first established in a scientific way, that milk as other fluids, could under certain precautions be drawn from the animal and retained free from decomposition, that is, that decomposition was due to organisms which reached the fluid from surroundings and air. Therefore, the milk in the presence of antiseptic means and high temperature acts not like an enzymatic solution, but as a medium which contains organisms capable of certain resistent powers. Therefore, the cause of lactic acid fermentation is an external one always, and the germs gain access in the stalls and storage places of the milk. These are only avoided with such caution as to give rise to the idea, as formerly in vogue, the milk itself contained the primary cause of fermentation in the form of a chemical substance.

I have in the above given a short resumé of the principal steps which led to the closer bacteriological study of milk; yet it is surprising that though Pasteur so long ago established the fact that the acid fermentation of milk could be avoided and gave data, no systematic attempt at milk sterilization was thought of in connection with infant therapy, until the work of Soxhlet, preceded by that of Hueppe, appeared, and this is explained by the enormous impetus given to modern bacteriological researches by the doctrines and methods of Robert Koch, which has permeated every branch of our professional work.

When we subject milk to heat, we have to meet the insurmountable obstacle of an organic fluid which not only may contain bacteria which are resistant to a considerably higher temperature than that of ordinary steam, but by the nature of its composition, milk is apt to protect to a very effective degree contained bacteria from the action of the externally acting heat. Again, milk, if heated to too high a temperature, changes in color, and there is a separation of certain elements (butter), and a change in others (caseine and sugar elements). From the temperature of 75° Celsius, there is separation of the serum albumen of the milk. The caseine loses its coagulability to rennet, and at 85°, amounts which for the raw condition are found sufficient to act, cease to be of any effect. J. Munk found that in milk sterilized under three atmospheres, four times the ordinary quantity of rennet was necessary in order to act satisfactorily. Hueppe has confirmed this, as also in another manner Dr. Chapin, who has, it seems, come to the independent conclusion that the caseine of the milk suffers a change in sterilization (*Med. Record*, 1890).

Hoppe found that milk sugar at 80° to 90° suffers a change, which increases at 100° to such an extent that, after two hours' exposure to this temperature, milk and milk sugar solutions become of a brownish tint. At a temperature of 110° this is more marked. Pasteur found that at a temperature of 110° to 112°, and 1½ atmospheres, there is a slight oxidation of the fats in the milk, which gives it a tallowy odor.

Hueppe concludes that between 75° and 100°, the milk is gradually changed in its chemical composition, but these changes are of such a nature that the digestibility of the milk is scarcely diminished, and its taste and odor but little changed. A temperature of 140° may coagulate the caseine (Hoppe), and at 120° coagulation begins to set in, if this temperature is kept up for any length of time.

I have here tubes in which the milk has been subjected to only the Pasteur temperature, 1½ atmospheres and 112°, with only the brown discoloration to be noticed, from inspection.

The above facts are and will be useful in guiding future work upon this subject, and the law laid down by Hueppe still remains true, that from a physiological standpoint, milk is best sterilized (if possible) under a temperature of 75° C., but it may be admissible as far as 100° C.

We have of late years been recipients of many suggestions as to sterilization, but if we look at the mass of matter and suggestions, we will find that though the above principles still hold good, and have been established for decades, the only direction toward which the ingenuity of physiologists and clinicians has exerted itself, has been mostly in the empirical direction of some form of "*apparatus.*" Thus, in the great struggle to invent some unique form of cooking utensil, some great truths have been lost sight of and buried in the débris of apparatus. The sterilization of milk may be performed, according to Pasteur, absolutely, at a temperature of 110° to 112° and an increase of ½ an atmosphere. This has its objections, and these are, as it seems, very formidable, not only from an æsthetic standpoint, but the physiological also. The caseine, which even at 75° begins to change, certainly approaches the coagulation point (from heat alone) at the Pasteur temperature. Not only this, but there is reason to believe that such caseine is even less acted upon by the weak stomach juices of the infant, than we at present are led to believe from physiological experiment. Another method of sterilizing the milk is also a gift of the genius of Pasteur, and that is the so-called "Pasteurization" of milk. In the *Zeitshaf f. Hygiene*, Vol. viii, Heft. 2, Bitter has attempted this method. Milk is heated in large masses up to 70° to 75°, and maintained at this temperature for half an hour, then rapidly cooled; this is done by passing the milk over coolers until the temperature of 18° to 19° is attained. The milk will keep quite well for some time—twenty-four to forty-eight hours; but this scheme is scarcely practicable. What I mean by this is, that no means are as yet at our disposal to place this in every household. Strub (*Bact. Centralbl.*, 1890) gives details of a method by which milk heated to 70°, and very rapidly cooled to 40° or even 20° Celsius for about five successive times, has given satisfactory results in mercantile departments of milk industry; but the apparatus necessary for this, it is needless to say, must be very elaborate.

We next take up the sterilization of milk at the heat of boiling water, in a water bath, that of Soxhlet, of Munich. To this man will always remain the great merit, not of having done anything new, but of practically placing milk preservation within the reach of every housewife, and of putting into practice certain principles for whose reception the therapeutic world was not hitherto prepared, though these principles were well-known. Soxhlet (*Munich Med. Wochen.*, 1886, p. 253), brought forward in a striking way the advantages of protecting the infant from the acid fermentation of milk, and he eliminated it very easily by, as you all know, placing the nursing-bottles in boiling water and leaving them thus for forty minutes. He also called attention to external sources of uncleanliness at dairies, such as pots, hands, and the state of the udder of the animals. Soxhlet, at that time, said that milk thus treated could be kept at the room temperature three or four weeks without spoiling or becoming acid. This I will show is true to a certain extent. It is a misleading statement. He gives some interesting data as to the time and temperatures at which ordinary acid coagulation of milk takes place. Thus: at 35° C. in 19 hours; 25° C., 29 hours; 10° C., 208 hours; 0°, 3 weeks. In any acid milk, fermentation at 35° C. results in the production of 3 per cent. of alcohol, almost as much as that contained in beer. Soxhlet placed great stress upon his peculiar stopper, which I will take up later. It remains that the Soxhlet plan is that of the boiling water bath, and it has its drawback in a certain amount of irregularity of heat conductively, by which the methods and results are less uniform than that of the next method, which I think is the most satisfactory, and that is the sterilization of milk by the plan first advocated by Hueppe in 1884 (*mitheilungen aus der Kaiserlich gesundheits amt*). By this method, the milk is sterilized in small quantities, but the water does not reach the containing flasks, and steam alone is the means of sterilization. The results are certainly more uniform by the sterilization in steam. By this uniformity, I simply desire to mean that we are first certain that every flask, being surrounded by steam, receives the benefit of the same quantum of heat, 212°, and the latent heat of steam. The conclusions of Hueppe were that steam is most satisfactorily and rapidly generated in the ordinary protected tin pot of Koch, and milk which in reagent glasses had to be subjected to the boiling bath for one hour, was easily protected and sterilized from acid fermentation in twenty minutes in the live steam. This is of great economic, as well as of scientific importance, and is another guiding-post for future work. Occasionally, in this short space of time, the milk sterilized in reagent glasses would subsequently coagulate, but in forty-five minutes the sure sterilization resulted. Hueppe noticed that in milk which was certainly sterilized at 100°, there appeared gradually a sediment, which he thinks contained the separated albumen and coagulated caseine, and the milk above this sediment was more watery than the milk sterilized below 75°.

Thus the milk sterilized under 75° differs from that sterilized at 100° in the more marked appearance of sediment, and its insolubility. Naegeli noticed changes even in milk heated to 110° to 120° after four to six months, both in appearance and taste. Meisl (Hueppe) records appearance of pepton, tyrosin and leucin, and ammonia, in milk apparently sterilized. As far as our knowledge goes, milk may be absolutely protected from future *acid fermentation* by subjecting it to a temperature of 100° in live steam.

I will ask you to notice that there is another fermentation of milk, the alkaline concerning which a great deal of misunderstanding exists, but about which there are certain well known facts to which I beg your present attention.

The acid fermentation of milk is brought about chiefly by a species of microörganisms called by the author, Hueppe, who very closely studied its growth and behavior, the bacillus of lactic acid fermentation of milk. The milk as it reaches the purchaser is very rich in microörganisms, but this one alone is chiefly responsible for the sour reaction of spoiled milk. I show you a culture of this in various media and fluids, and you will see it was well described by Hueppe.

I do not think this is the place for close bacterial descriptions, but let me call your attention to some very interesting data. This microörganism is of small oval form occurring single and in pairs. It does not fluidify gelatin and grows upon all media, when it is inoculated into absolutely sterile milk (milk subjected to temperature of 112° and 1½ atmospheres); there is in a short space of time a coagulation of the caseine elements, but what is most interesting, is the accummulation of bubbles of CO_2 gas at the top of the milk and near the top. I show you a potato culture of the bacillus of lactic acid and you can see the bubbles of CO_2 in this culture also. The coagulum of the milk is peculiar, in that it is traversed by fine spaces and cracks, in which are entrapped bubbles of CO_2. The spaces become larger and wider; the coagulum contracts after a few days. In these spaces there is a serous fluid. The microörganism measures 1–1.7 μ long and .3 μ to .4 μ thick: the bacteria may reach 2 μ in length. Hueppe thinks they contain spores, especially in sugar solutions; he also found these spores in sour milk. (But this is difficult to reconcile with some statements of Loeffler, which will be referred to below.) This organism grows from 10° C. up and has its maximum growth between 35° and 42°; it also stops growing and the acidity no longer forms at 45.3 to 45.5°.

It is not necessary to go into further details, but we must remember that the heat of steam, while it may in twenty minutes destroy the lactic acid bacillus, does not entirely destroy the spores, so that a prolonged steaming is necessary to absolutely render these spores inocuous (forty-five minutes). Thus, as mentioned, Hueppe found that test tubes of milk sterilized for twenty minutes in steam, did not always remain free from acid fermentation, the spores subsequently growing and causing acid fermentation, and I myself have seen tubes heated with steam for twenty minutes undergo subsequent acid fermentation in the thermostat, turning the litmus, which was mingled in some of the tubes, red, and finally decolorizing it. The lactic acid bacillus of milk is able for a time to resist the temperature of steam.

It has been noticed (Pasteur, Naegeli, Hueppe, Meyer, Loeffler) that milk which has apparently been thoroughly sterilized, will after a space of time, varying in each case with circumstances of temperature and previous state of the milk, undergo changes and a distinct precipitation, or rather coagulation, sometimes with the formation of peptone, leucin and tyrosin. Pasteur, as above mentioned, established that these changes always occurred in the presence of an alkaline reaction; when milk was sterilized at 100° C. acid reaction was never present. He named the bacteria thus found in the milk so decomposed, infusoria; we know now that they are always rod-shaped or bacilli. Acid reaction is never present except to a slight degree at first with the butyric acid bacillus (Hueppe), but alkaline reaction soon results even here. Hueppe first described a butyric acid bacillus (aerobic) which he found in milk which had been subjected to three atmospheres of pressure with corresponding high temperature. This milk was decomposed and contained a bacillus which was very resistent and could withstand very high temperatures; even much higher, as you see, than the 1½ atmospheres of Pasteur. This bacillus or microbe contains spores and it is in this the resistance to temperature exists. Hueppe described this bacillus minutely, and we are able to find it to-day in milk (Loeffler). I have been able to isolate a bacillus very much resembling it with others from milk sterilized by various apparatus and have found it in a sample of milk which had been sterilized by the Escherich new large sterilizer, in which the milk is sterilized in quantities of about a quart. The milk was taken from the sterilizer on the second day after sterilization. The milk was slightly alkaline and subsequently became very alkaline in reaction with small and large soft clots of a peculiar odor. This is nothing new, but it will explain other facts hereafter to be stated. The ordinary potato bacillus (bacillus mesentericus vulgatus of Flügge) was also present at the same time. Loeffler (*Berlin. Klin. Wochen.*, 1887) not only confirmed Hueppe's investigations, but found other bacteria, all varieties of the ordinary potato bacillus, in milk which had been subjected to the temperature of steam for ten min-

utes. This temperature destroys the bacilli and other bacteria, but not the spores, except those, this not always as Hueppe found, of lactic acid fermentation. These spores subsequently decompose the milk through their proliferation, but always with alkaline reaction. The coagulation of the caseine is also of a more flocculent character. There are first the ordinary potato bacillus, the bacillus mensentericus vulgatus of Flügge, then the white bacillus, a subvariety, as also the gummy (bacillus liodermos of Flügge), and a third variety of the same organism which Loeffler calls the white bacillus. It would be sufficient to mention these here and to show how they grow only in sterilized milk. In sterilized milk, the potato bacillus (first described by Hueppe) after a few days in the thermostat causes the appearance of a clear zone underneath the cream zone at the top of the milk. This zone varies from a clear to a cloudy one, according to the varieties of potatoe bacillus which is inoculated or growing in the milk. Crystals of leucin and tyrosin appear at the bottom, in case of the white bacillus. The reaction of the milk is distinctly alkaline. The most important lesson to be learned from the above is that milk well sterilized by steam with any apparatus (Koch, Soxhlet, Escherich, Arnold steam cooker) will after a time decompose with an alkaline and no acid reaction. The time at which macroscopic changes appear has been regarded by some authors as the surest sign of decomposition, but they have mostly, even in late times talked of the milk becoming sour, as you see it does not undergo acid fermentation but alkaline fermentation.

Strub (*Centralbl. f. Bact.* 1890) has experimented with almost every known apparatus and was able to establish even immediately after sterilization the potato bacillus in the samples of milk which she used. She also established that repeated fractional sterilization in a Koch apparatus was not sufficient, even after many repeated steamings, to entirely destroy this bacillus (its spores).

Especial interest is the behavior of bacteria when inoculated into milk (sterilized) to which litmus (1–10) according to Liber and Marpman, has been added. There is a gradual decolorization of the litmus in some, showing that there is something formed aside from pure alkalinity or acidity, which has oxydation action upon the litmus.

I show also that the lactic acid bacillus turns the milk with litmus red and finally decolorizes it. The streptococcus pyogenes turns the milk acid, litmus red and finally decolorizes it. The typhus bacillus (Loeffler) turns litmus (sterilized) milk slightly red. Tubercle diphtheria and cholera microbes grow very well in milk without causing any marked change in the same. The substance which with the lactic acid bacteria and potato bacillus causes decolorization, is not as yet established.

The object of this paper being a review of our knowledge of sterilized milk and its value, as also the writer's observations in this line, it is foreign to consider here the decompositions or contaminations of milk as we find it in the stores. The heat of steaming is a protection against those microörganisms which cannot withstand this high temperature and maintain life (tuberculosis, diphtheria), as also against the occasional animal diseases. The blue milk and stringy slimy milk (Hueppe) as also even tuberculous milk, form such a distinct field of work, that a separate paper could be written upon them alone. What practical deductions can be drawn from what has been stated above concerning ordinarily good milk and its sterilization, seems very evident. The first is that milk can be thoroughly protected from subsequent rapid acid decomposition by exposure for a certain time to the temperature of steam, and to accomplish this, the several apparatuses in the market are entirely efficient. It matters very little how many or what variety of microörganisms exist prior to steam, after this only those microörganisms remain capable of proliferation whose spores have a resistance against continued application of 100° C. These in normal milk have been shown to be the butyric acid bacillus and the various varieties of the ordinary potato bacilli. If milk be sterilized and it is found to contain these microörganims after steaming, their number and capability of doing injury to the milk will vary very much with the conditions under which the milk has been collected. If these microörganisms preëxisted in enormous quantities, the alkaline fermentation will under a favorable temperature, set in sooner. If in small quantities, the macroscopic changes of the milk will be scarcely perceptible for some time. If milk could be carefully collected and sterilized at the dairies it might be kept indefinitely after sterilization. Thus, it is seen that even directly after steaming the microörganisms and their spores exist in sterilized milk if they cause the subsequent decomposition. Strub (*Centralbl f. Bact.* 1890) found that the variety of cork or method of closure of the bottles in childrens' apparatus had very little to do with this subsequent decomposition. Bacteria were present in the sterilized milk, no matter what kind of closure (Soxhlet, cotton, ordinary rubber) was used. But the most important point here to remember and what is known to those who have given thought to this subject, is that the bacteria of the alkaline milk fermentation are very slow to proliferate in sterilized milk; at room temperature the changes in the milk are at best delayed for a few days, even a week, and when the changes are not so marked as to be detected by the eye; such milk has been sold in

the stores and given by others to infants without *seeming* deleterious results, at least not such as are immediately apparent after administration of sour milk. Therefore the influence of bacteria which remain in normal cows' milk after sterilization is of little practical bearing for infants, inasmuch as most families prepare milk daily, and I have never nor can I find data where any one else has found the alkaline fermentation in milk so marked, after, say, forty-eight hours, as to cause macroscopic marked changes. I refer only to the infant apparatus and summer temperatures, and not to those experiments in the laboratory where sterilized milk is inoculated with masses of active potato bacilli spores and bacilli themselves, and specimens of which I show you here. I would not approve, therefore, of the use of any milk in the city which, however well sterilized, was kept for days, and though its color was good, as also its appearance, and it tasted well, is the seat of advanced changes. We find such milk sold in stores where the bottles have been kept even two weeks after sterilization. True, the alkaline fermentation has not been investigated to such an extent that we can with certainty pass upon the deleterious or non-deleterious effect upon infants of the products of this decomposition. It is enough that they take place, and certain alkaloid elements are surely produced, but very slowly, and if the milk is steamed as in the household daily, may be disregarded; but the storage of sterilized milk and its subsequent use after prolonged periods, is to be strongly discountenanced. Therefore in the future, we will know how to interpret those authors who condemn sterilized milk with faint praise by stating the number of bacteria (?) they have found in sterilized milk without stating the whole case. I have had this "clear statement of the case" in view when I undertook the above work, and I hope I have, in a degree, succeeded.

To state that bacteria exist means very little, we must know what variety and their behavior. There is an important practical point which to the writer seems pertinent here: Many physicians have often told me, and no doubt you also, that they find the boiling of the milk sufficient sterilization, or that they cannot see why it is not fully as good as continued steaming. Never was a greater fallacy born of empiricism. Hueppe has shown that milk in small test tubes (10 ccm.) exposed for twenty minutes to the action of live steam at 100° C., are not surely protected from subsequent acid fermentation, and that some of his tubes thus treated turned sour after a time. Here is a tube of milk stained with litmus originally and exposed for twenty minutes to the action of steam in the Koch pot. After placing it in the thermostat at a temperature 35½°–36° C. it turned red in twenty-four hours; this became more marked until full coagulation of caseine resulted, and with decolorization of the litmus. Thus, simple, single boiling of the milk, as it is performed in the kitchen ordinarily, is insufficient to protect milk, aside from facts of exposure of milk to atmosphere and handling subsequently, which enhances chances for decomposition.

Physiological.—There have lately been some experiments, and notably by E. M. Hiesland and H. D. Chapin, upon the digestibility of sterilized milk and the chemical changes in milk brought about by steaming. Their conclusions are so much in accord with those of Hueppe and Munk, their quotation here would only repeat what has been recorded above. Dr. Hirst (*Med. Rec.*, 1891, February), has gone so far as to suggest the addition of milk or some pancreatin powder, before sterilization, in order to digest and help the digestion of the caseine made difficult of digestive solution during steaming. Whether this will prove a valuable suggestion remains to be seen. For myself, I must say I still hesitate to put any digestive powder in the milk of the healthy infant, but in a stomach which proves rebellious, I have been in the habit, like many others, of adding powders to sterilized milk, but have hitherto done this after sterilization and just before giving the milk to the infant. The physiological data of our knowledge in this department of infant dieting are still very meagre, nor has the stomach washing of infants before and after ingestion of foods thus far aided us materially in coming to definite conclusions. Interest has lately been aroused in the discussion of the amounts of milk to be administered to the infant at each feeding. On the one hand, we have Dr. Escherich, who is still guided mostly by the age of the infant, and on the other in our own country, Seibert has advocated the weight as the only criterion for infant feeding; Seibert would reject all past methods and ask his adherents to give certain amounts to certain weights of children. Seibert gives us a table. But these agitations have had their uses, and now attention is being directed more fully to this subject than hitherto.

I have always been guided as follows: I weigh my children always at the beginning of treatment; if their weight comes up to the standard or nearly so, they are given the amount of food which long series of experiments by physiologists and clinicians have proved to us to be adequate for normal children at certain ages. (Vide Fleischman Pædiatrische studien, Vienna, 1875). If the infant is markedly atrophic, and as I have seen at three months only weighing less or much less than an average infant at birth, a proportionate amount of food is given. The weight of the child divided by the weight that would be normal, multiplied by the amount of food (grams) necessary to an infant of normal weight and development, at each feeding.

X—weight of infant; Y—weight of normal infant of same age; Z—amount of food at each feeding which is normal to an infant at that age (as far as our knowledge goes).

$\frac{X}{Y} \times Z$ – amount of food to be given at each feeding.

The above digression is warranted by the close connection it bears to any theme of infant feeding, and especially in sterilization, where the size of the individual bottles are a matter of care to the mother.

I cannot close this paper without some practical suggestions, and if they appear trite, they have at least the value of being based upon a large experience. As intimated it would be ideal to sterilize milk in small or large quantities at the dairies, but this has never yet been attempted in this city.

The writer uses as a sterilizer the ordinary wire basket with eight bottles, sold everywhere with the ordinary rubber cork. If the patient can afford it and wishes a rapid steam generator, the patent cookers are good, if not, any pot will do which is big enough to hold the wire basket of bottles. The milk or milk and deluent are placed in the bottles, which have been thoroughly cleaned with hot soda water, and an inch and one-half of water is placed in the bottom of the pot; when the water is boiling, the basket of bottles (without corks) is lowered into the pot and the same is covered. They are steamed thus for ten minutes to drive residual air out of the bottles. The pot is opened and each bottle is firmly corked and the pot covered, and steaming continued 45 minutes longer, when it may be considered completed in any weather. The basket of bottles are then placed in a shady cool place. If the family be intelligent and the bottles are not to be transported, the baked or even ordinary cotton may do as closure for the bottles.[1] Future efforts must also be made in order to obtain for the infant a milk which will be as free from contaminating elements as possible. A strict hygienic surveillance of dairies by competent persons, who can recognize diseased animals and milk, a strict accountability as to cleanliness of animals, utensils and hands. The rejection of receptacles which are unclean or composed of objectionable material will render milk sterilization in the household still more effective than it is at present.

[1] The fault to be found with the sterilizers now upon the market (Arnold and other patent cookers excepted) is that though they can all be used a la Soxhlet, there is not space enough between the bottom of the basket and that of the pot to allow of the use of the apparatus with steam alone, that is the introduction of 1½ inches of water and its steaming for one hour without the contact of the milk bottles and the water; this causing breakage. A firm in Baltimore is constructing a very cheap but complete sterilizer from my plan which will obviate these objections and be within the reach of the most model household, per basket, bottles and corks complete.

INFANT DRESS.

Read in the Section of Diseases of Children, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

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The average practitioner of medicine pays too little attention to the subject of infant dress. He goes about his daily duties, cares for and applies remedies to the sick infant, and, it may be, never gives a thought whether the child is properly clad, or if the material from which the clothes are made furnishes sufficient protection from the sudden atmospheric changes to which its delicate tissues are exposed. When he attends a confinement case, he seldom hints at any proper, hygienic method of arranging the baby's apparel, or dictates to the unscientific nurse what the infant shall wear. This leaves the subject to the mother, who, in the majority of cases, ignorantly binds the infant hand and foot, so that there is interference with the proper development of its muscles. Then, as the child struggles and cries for freedom, it is doomed to the conventional dose of peppermint or paregoric.

Scarcely can any one find in our text-books more than a passing remark on the hygiene of infant dress; in fact, it seems to be thought quite out of the province of medicine, and nurses become indignant when a physician attempts to suggest that he knows more about the needs of a child than they. Few good physicians doubt that the average infant is unwisely clad at the present day. It is bound too tightly, clothed too heavily, especially about the waist, and the style of garments renders the free use of its limbs practically impossible.

Let us see how the average newborn child of to-day is dressed. The baby being washed, the navel string is wrapped in a bit of linen, often well greased, and a flannel binder, extending from nipples to hips, is tightly wound around the body two or three time, and secured with four safety pins; the objects being to keep the abdomen warm, and prevent hernia when the child cries or strains.

Let us pause here a moment, and consider this binder. The Creator made the abdominal walls of a child elastic for a purpose, namely, to expand and protect vital organs when the little one cries, coughs or strains. If let alone, does it usually rupture? No. In crying or straining, the walls distend evenly in all directions, thus protecting the feebler portions, where hernia is apt to occur.

The binder prevents this even distribution of force, hence, the whole energy of the straining comes on certain parts of the walls that are weaker, and which, unfortunately, the binder

does not protect, and hernia is the result. It is the bandaged baby that becomes ruptured.

Now, suppose the binder is used for warmth alone, and is applied loosely, what happens? We undress our infant to find the binder up under the arm-pits, and the abdomen exposed. I have yet to see the necessity for any binder at all, unless to retain the dressing about the navel, and that only for a few days.

The best dressing for the navel, I think, is a simple pad of dry, antiseptic, absorbent cotton, wrapped about the cord, and left secured with a turn of a roller bandage, or a piece of adhesive plaster.

The next article of apparel is the shirt, made of all sorts of material; all wool, cotton and wool, silk, silk and wool, flannel; and I have even seen one made of linen, the coldest of goods, and starched stiff at that, keeping the baby fretting.

Then comes the pinning blanket, a long wool garment with a stout band, often of cotton. This is pinned snugly around the body up under the arm-pits, so snugly, in fact, that it materially interferes with the free expansion of the chest walls. One side is folded over one limb, and one over the other, and the bottom turned up and pinned, thus the infant is unable to move a limb. When a change of diapers is desired, the blanket is unfolded, exposing the child from foot to abdomen.

Now, a baby so exposed to varying degrees of temperature, and especially if overheated or perspiring, offers a factor in the etiology of any acute disease.

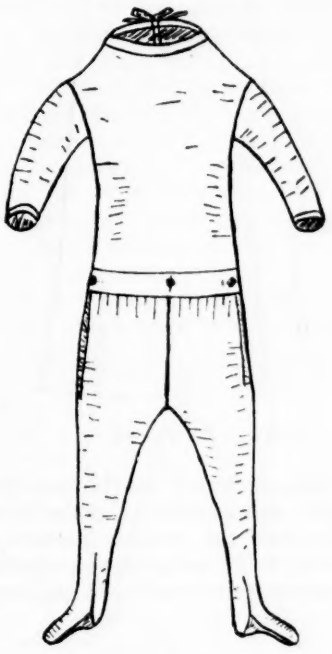
Next comes the skirt, with the same objections as the pinning blanket, tightness and inelasticity about the chest walls. This serves to increase the bulk and weight of clothing around the body of the infant, leaving the shoulders comparatively unprotected by only the light shirt and thin muslin slip, the last garment to be added.

Such is the dress of the average infant of today, and I ask, is it not time for us, as physicians, to give more thought to this subject, and instill, if possible, more hygienic and practical methods of dressing young children, to the minds of our respective communities?

The problem before us to solve, is to find something that will allow freedom of muscular movements, and having simplicity, will furnish warmth and protection.

First, let us consider the material to be worn next the skin for young infants. Of course this largely depends upon the financial condition of the parties interested, but the texture should be soft, non-irritating in character, warm, and as light in weight as latitude and climatic conditions will allow. Quality should take the place of quantity in baby clothes.

Then, too, we have the various infantile constitutions to adapt our suitings to, because sickly infants, or those susceptible to colds from atmospheric changes, need greater protection than the robust and healthy. For those that can afford a dollar a yard, or more, the silk and wool flannel furnishes as complete protection as any material, and is, perhaps, the best goods to be worn next the skin; care, however, should be taken in washing it, as well as all other woolen goods. All wool materials are rather harsh and irritating to an infant. For the middle and lower classes there is nothing better than canton flannel; it is soft, warm, shrinks little, and can be obtained in various grades of quality, from 12½ cents to 50 cents a yard. For sickly children, an eider-down flannel is an excellent protective.



Whole of undergarment
front view

The infant dress I have to propose consists of an under-garment, covering the body from neck to feet; a skirt, supported from the shoulders; and a flannel slip in the colder months, or a muslin in the warmer, for an outside dress. There is no necessity for binder, socks or pinning blanket. I have for some time entertained the thought of reducing the size of the ordinary shirt and drawers pattern of nightgowns, worn by older children, to fit the average infant of two months, thereby allowing for the largest newborn child, or for the growth of the average baby to two months.

The development of this thought is the undergarment here exhibited. One modification I found by experience was necessary, namely: the

drawers should be made to separate from the shirt, if I wanted to make the changing of diapers easy, and avoid the washing of a whole garment where one part only was soiled. The under-garment can be made by any seamstress,

Flannel skirt

to cost as little, or much, as the quality of goods used requires, and as prettily as the style of garment or fancy of the mother permits. It consists of a shirt made with sleeves, opening in the back and reaching from neck to hips, long enough

Back of shirt

to meet the growth of the baby by simply altering the four buttons at the waist, to which the drawers are attached. This allows the whole garment to be supported from the shoulders.

Two buttons at the back opening of the shirt are sufficient, a tie-string in the neck taking the place of the third. Lace may be put about the neck and sleeves. The drawers are made with flaps, as in the ordinary children's style, loose enough in the seat to allow for diapers. It is easier to unbutton four buttons, turn down the flaps and change diapers, than to unfold and unpin a pinning blanket, and in this suit all undue exposure of the limbs is prevented. The legs of the drawers are made to cover the feet, so that socks are unnecessary. It is intended to cover the under-garment with a simple skirt of good flannel, supported by shoulder bands, and reaching 5 inches below the feet, and over this a light flannel wrapper or muslin slip.

Thus the infant is clothed as prettily as the mother desires to make the suit, and as loosely, evenly and warmly as the interests of its own health require.

1438 Dorchester Ave.

"TETANUS NEONATORUM."

Read before the Section of Diseases of Children, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

BY B. A. WADDINGTON, M.D.,
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I have seen in a practice of over twenty-six years eight cases of "Trismus Neonatorum;" of these six have been fatal in their termination, two have recovered.

I believe it to be of parasitic origin, the microorganism most likely a "coccus." I do not say that it never occurs in the lying-in room of the cleanly with proper aseptic surroundings, but know that in all the cases I have seen the environment has been one of filth and squalor. My experience shows that more cases occur among the negroes than among the whites. Of the eight cases seen seven were negro children and one white child.

In the six fatal cases I resorted to the usual remedies: Calabar and chloral hydrate internally, chloroform by inhalation, ice to spine, Marion Sims' procedure of manipulation of occipital and parietal bones to relieve pressure upon medulla oblongata or cerebellum, but all of no avail, the little ones died. But I now believe with proper aseptic and antiseptic treatment, there should seldom, if ever, be seen a case of "Tetanus Neonatorum."

In support of this theory, will report my two cases of recovery, with treatment:

Case 1.—Was called to see child (colored), at 12 M., January 10th, 1889, six days after its birth. Upon opening the door of the room in which the child was lying, a tetanic spasm was induced, lasting about three minutes, trismus marked, deglutition impossible, oposthotonos well defined, temperature 110.05F. Upon examination of ab-

domen found that the cord had sloughed off, leaving a nasty cauliflower excrescence exuding an ichorous discharge. Had the parts thoroughly cleansed with beta-naphthol solution and applied iodoform dressing, ordered internally one grain beta-naphthol and one grain chloral hydrate every hour, found no overlapping of occipital or parietal bones. Remained in the house about two hours, during which time the child had ten decided convulsions, ordered remedies continued and dressing changed at bedtime. Saw patient at noon the following day, found him sleeping quietly, had had ten or twelve light fits, the mother said, since I had been there, had made several futile efforts to get hold of nipple, had succeeded about an hour before my arrival, nursed freely and went to sleep. Ordered same doses of naphthol and chloral at two hours' interval and reapplied dressing to navel. Saw patient again at 4 P. M. next day, free from convulsions and all bad symptoms.

Case 2.—On March 3d, 1891, was called to see Mrs. ——, the wife of a junk dealer, whom I had put to bed in labor ten days previous, and delivered of a healthy male child. She was suffering from a slight hemicrana, for which I prescribed, and was about leaving the room when she called my attention to the baby. She said that through the night he had tried to nurse but seemed unable to take hold of the nipple, but that she believed that he had three or four light fits.

I asked to see his abdomen, and while the mother was unpinning the bandage a marked and decided tetanic convulsion occurred, trismus, sardonic countenance and the most pronounced opposthotonos I have ever seen in a baby. Found the navel in a filthy condition, protruding granulations and fœtid discharge. Ordered at once the thorough cleansing of the parts, syringing with peroxide of hydrogen and dressing with beta-naphthol; while this was being done the child had a number of convulsions, the least noise or draught being sufficient to produce one. Ordered beta-naphthol in one grain doses every half hour, and chloral hydrate, one grain doses every hour. This was at 9 P.M. Saw patient again at 12 M. the day following, symptoms greatly improved, had taken the breast once, the spasms were further apart and less violent, had slept considerably, ordered remedies continued but at further intervals. Saw child again next day at 3 P.M., all trismus gone, able to nurse freely, had had but two light spasms since I saw him last, navel quite healthy in appearance, and all fœtor gone, continued the washing with peroxide and the dressing of beta-naphthol and internal remedies every three hours. Saw child next day at 10 A. M., well. Saw him again yesterday, still well.

THE EPIDEMICS OF INFLUENZA OF 1890 AND 1891 IN CHICAGO.

Read at the Congress of American Physicians and Surgeons, before the American Climatological Association, Washington, D. C., September, 1891.

BY E. FLETCHER INGALS, M.D.,
OF CHICAGO, ILL.

The epidemics occurring in Chicago the last winter and the preceding year differed from each other considerably in their effects upon the respiratory and digestive organs and the nervous system.

In 1890 the disease made its appearance about the first of January, but in 1891 not until nearly the first of March.

Persons of every class, all ages and either sex were attacked, but, as indicated by the observation of Dr. J. Suydam Knox[1], children suffered from it much less than adults; however, Dr. Charles Warrington Earle[2] saw many cases in children whom he thought experienced the same symptoms as adults. From my own observation, it appears that children were much less frequently affected than those of more advanced years.

The exact period at which the influenza first showed itself cannot be determined. Four or five weeks preceding the actual beginning of the epidemic, many patients suffered from acute rhinitis and sore throat, which were often termed influenza, though they did not appear different nor much more frequent than the colds which prevail in ordinary years.

However, during this same time, there occasionally occurred cases presenting the peculiar symptoms of sudden fever, malaise, great prostration and aching of the muscles, which have been so noticeable during the two epidemics. These isolated cases presented all the characteristics of influenza, and doubtless were of that nature; and it is probable that the peculiar condition or conditions causing them had more or less to do with some of the cases of acute rhinitis and sore throat just referred to.

The statistics of the Chicago Board of Health show that in 1890 there were 64 deaths in January from influenza, 37 in February, and 7 in March; and that in 1891 there were 4 in January, 6 in February, and 155 in March.

These, however, cannot be taken as accurate indications of the prevalence of the disease, for the returns are made by practitioners of all kinds, many of whom, during the reign of the epidemic, in order to retain the good-will of their patrons, found it expedient to confirm the diagnosis of "La Grippe" which had already been made by the patient or his friends. However, in these same months there were a larger number of deaths from pneumonia, very many of which were due to the influenza as a primary or com-

[1] Chicago Medical Recorder, p. 46.
[2] Ibid, p. 462.

plicating factor, and the prevalence of inflammation of the lungs, as pointed out by Dr. N. S. Davis, Sr., may fairly be taken as an indication of the extent and virulence of the epidemic.

In 1889, the year preceding the first occurrence of the epidemic, which was an average winter, there were recorded 384 deaths from pneumonia during the first three months; 128 in January; 111 in February, and 145 in March.

In 1890, the first year of the epidemic, during the same period there were 1,096 deaths from pneumonia, and in 1891, the same period, 1,233, of which 280 were in January, 233 in February, and 720 in March. The greater development of nervous diseases, as shown by Dr. Archibald Church,[3] is also to some degree an indication of the extent of the epidemic.

As the character of the disease became pronounced, its accession was usually marked by a mild degree of inflammation of the mucous membranes, with lassitude, weariness, pain in the muscles, more or less distinct chill, and fever, ranging from 102 to 105° F. The pain was usually of a neuralgic character, and frequently disappeared within one or two days. In some instances, the mucous membrane of the eye and ear, in others of the respiratory passages or digestive organs, and in still others of the urinary tract, were most affected.

Dr. F. C. Hotz[4] observed a large increase in the number of cases of conjunctivitis, both in dispensary and private practice, though there was nothing peculiar about the inflammation. More frequently he noticed inflammation of the cornea, ushered in by symptoms of acute irritation similar to those caused by a foreign substance under the conjunctiva.

These were always confined to one side, and were of two types; in one there was a zigzag line of superficial ulceration beginning at some point on the border of the cornea, and traveling toward the center, always confined to the surface layer of the corneal epithelium. In the other the surface of the cornea showed no disturbance, being smooth and brilliant, but on close examination by focal illumination, small, round, grayish spots were found located in the deeper layer of epithelium. In these latter cases, the pain and sensitiveness of the eyes, the quick reaction to the slightest touch, and increased secretion of tears, were very marked. These were easily mistaken for simple conjunctivitis if the cornea was not brilliantly illuminated by focal light. In these the congestion of the conjunctiva was pronounced, but did not show that dense red zone around the cornea usually characteristic of the inflammation of that tissue. The superficial ulceration recovered quickly, but the latter variety was of slow progress, and two months was the shortest period in which the eye recovered its normal condition, though the ultimate prognosis was good in both varieties.

In the treatment of these cases, cocaine was the only local remedy which gave even temporary relief. Mydriatics seemed to act indifferently, or even to aggravate the irritation. Quinine internally had a decidedly beneficial effect on the neuralgic symptoms.

He observed numerous cases of inflammation of the middle ear, some of mild form, causing the patient but little pain or inconvenience, except a feeling of fullness in the ear, tinnitus or a buzzing sound, with slight deafness.

In others the inflammation was more severe, attended by rapid secretion of fluid, deep congestion, and marked bulging of the drum-head, with violent neuralgic pain in the ear, radiating over the side of the head. In these the hearing was speedily lost, and sometimes the drum membrane was perforated within the short space of twelve hours. The pain, which was of a severe form, did not usually, as in ordinary cases, subside with discharge of the secretion from the middle ear, but often continued for some time afterward. These cases were unilateral.

As a rule, the prognosis was good, no matter how severe the symptoms, and in most cases there was speedy recovery, but in a few the mastoid cells became involved.

He relied upon quinine internally to relieve the neuralgic symptoms, and recommended mild local applications, under which he had observed the quickest recovery.

Instillations of warm solutions of boric acid, with cocaine, and the occasional use of the Eustachian catheter for relieving the middle ear and tube of accumulated mucous, constituted the main local treatment.

Dr. Church[5] believes that there was a well-marked variety of influenza properly denominated "nervous," which was indicated by the almost instantaneous prostration after the onset; the disproportionate asthenia during its course; the severe rachialgia, neuralgia, headache and sleeplessness, and the subsequent long, persistent neurasthenic state.

He believes the infection of influenza had a marked action upon the nervous system, giving rise to immediate acute manifestations, or to remote and persistent conditions; and that in those predisposed to la grippe, it was competent to cause marked excitement or great depression of the motor, sensory and mental apparatus.

During the progress of the epidemic, we observed frequent cases of this variety of the infection, indicated by pain, nervous prostration, local sweating, convulsions, coma, delirium and mania. During the prevalence of the epidemic, the deaths from nervous diseases were more than double the

[3] Ibid, p. 418. [4] Ibid, p. 413.

[5] Loc. cit.

number returned for the similar periods in other years.

The first epidemic was characterized prominently by rheumatoid and muscular pains, sometimes followed by articular rheumatism, and the last epidemic more by disturbance of the digestive organs.

The epidemic of the past winter has been followed by a widespread outbreak of typhoid fever, which, according to Dr. William E. Quine,[6] has rarely, if ever, been equaled for the season of the year in this or any other section of the country; while in 1890, consecutively to the epidemic or concurrent with it, cerebro-spinal meningitis was extremely common.

Dr. J. H. Hollister[7] had observed, as a prominent feature of the last epidemic, a form of continued fever, running from five to fifteen days, with high temperature and without intermissions, usually termed typhoid, but differing from it in that the specific ulcers of the glands and the characteristic stages and symptoms of typhoid fever were absent.

The effects of the disease upon the respiratory mucous membrane occurring under my observation did not differ materially in the two epidemics. There appears to have been some difference in the type of pneumonia, that of 1890 being more commonly of a catarrhal character, or broncho-pneumonia, and that of 1891, more frequently than in the former epidemic, of a croupous character. From my own research, I would conclude that during the past winter the tendency to the development of inflammations of the pleura has been much more pronounced than during the preceding winter. Many cases appeared peculiarly liable to terminate in suppuration. This view differs from the impressions of Quine,[8] who thought the suppurative process more common in the epidemic of 1890.

The attack of influenza was usually ushered in by a mild degree of inflammation of the conjunctiva, Schneiderion membrane and the fauces, characterized by lachrymation, profuse watery discharge from the nares, swelling of the turbinated bodies, and more or less congestion of the mucous membrane of the nasal cavities, with more marked congestion and soreness of the fauces. However, the inflammation in any of these localities was usually comparatively slight—much less than ordinarily anticipated in influenza; indeed, even less than frequently attends ordinary cold. In such cases, in the course of thirty-six to forty-eight hours, the disease generally progressed to the larynx, where it was characterized by hoarseness and a hacking, annoying cough. After three or four days, all evidence of the attack frequently subsided. This was a most common site of the disease in both epidemics. Next in frequency was one in which the trachea was chiefly involved; indeed, this seemed to me the most frequent of all where the patient was ill enough to consult a physician. The tracheitis was usually preceded by either rhinitis, pharyngitis, or laryngitis, but not infrequently was developed soon after the first symptoms of the attack, particularly without the intervention of inflammation of the upper air passages. It was usually attended with a most persistent tickling sensation in the trachea, which would provoke frequent, spasmodic coughs, generally attended, after thirty-six to forty-eight hours, with free expectoration. After four or five days, the sputa became of a thick, mucopurulent character, and often quite offensive to the patient. Such attacks, as a rule, were more protracted than those of the upper portions of the air tract, and often extended over three or four weeks.

Not uncommonly, in these cases, two months elapsed before the cough entirely subsided, and even then, on the occurrence of the slightest cold, the patient frequently complained of the same tickling sensation in the throat and irritating cough. Simple bronchitis, characterized by frequent spasmodic cough, and more or less profuse expectoration, was observed in a considerable number of cases, usually associated with one or other of the affections already mentioned, but occasionally independent. This, when uncomplicated, was not, as a rule, so obstinate as the tracheitis; however, in some instances, convalescence was delayed for several weeks, and in not a few cases the inflammation extended to the capillary bronchial tubes, and true catarrhal pneumonia was developed, which proved a most serious complication, and in not a few instance a fatal malady.

The majority of cases of pneumonia growing out of influenza were of the catarrhal variety, but it appeared to me that more were of this type in 1890 than during the past winter, when croupous pneumonia was peculiarly prevalent; the latter has usually run very much the course of ordinary croupous pneumonia, except that the patient has generally been more prostrated, and convalescence has been longer delayed. Pleuropneumonia has also been especially frequent, and uncommonly disastrous.

Cardiac symptoms, as irregularity, intermittence of the pulse, which was usually rapid but occasionally slower than normal, were frequently noted.

Dr. Quine[9] had occasionally observed individuals who suffered from the grippe in 1890, still presenting a pulse rate varying from 40 to 60 beats per minute, accompanied by an enfeebled general condition, and with a strong tendency to syncope. Some cases of well-marked angina pectoris were developed during the epidemic, appa-

[6] Loc Cit. [7] Ibid, p 460. [8] Ibid, p. 459.

[9] Loc. cit.

rently as the result of the influenza. Undoubtedly the cardiac complications frequently resulted from a rheumatism which was associated with the influenza, but most cases were apparently of nervous origin, and in some myocarditis or fatty degeneration of the organ appeared due to the specific effects of the morbific agent causing the epidemic, independently of rheumatism or other diseases in which the heart is secondarily involved.

Renal affections were frequently observed by Dr. I. N. Danforth[10] as the result of the influenza, which appeared to induce, first, hyperæmia more constant and intense than provoked by other acute febrile diseases; second, a catarrhal nephritis; and third, a croupous nephritis, as demonstrated by an increased quantity of albumin, and the presence of true hyaline casts.

The essential points in the diagnosis of influenza implicating more particularly the respiratory organs, as we observed it, were the sudden accession of fever, with headache and excessive aching of the back and limbs, peculiar prostration, and the symptoms and signs of inflammation of the mucous membrane. It was distinguished from ordinary acute inflammation of the respiratory mucous membrane by the history and physical examination. Acute follicular tonsillitis often gives almost precisely the same symptoms as influenza, and can only be distinguished from the latter by an examination of the throat.

Laryngitis, tracheitis, or bronchitis due to the epidemic, could only be distinguished by the history, the excessive fever, and by the unusual pain which attended the attack of influenza.

The prognosis of influenza has been considered so favorable that the laity, and even physicians, at first considered it a laughing matter; and it is true that the majority of cases recover after a short time, even without medical care. But many cases terminated fatally, especially when occurring in the aged or infirm, and the large mortality from other inflammatory diseases, especially of the respiratory organs, and of the gastro intestinal tract, was undoubtedly largely due to the influenza. In a light attack, two or three days were generally sufficient to establish convalescence, and many patients continued their avocations, in spite of the discomfort caused by fever and nervous prostration. Even when the trachea and bronchial tubes were involved, three or four days were usually all the patient allowed before he considered it necessary to be again about his business. The prostration, however, entailed by the attack, usually continued from one to two or three weeks. Either of the forms of pneumonia growing out of the influenza generally lasted from 50 to 100 per cent. longer than attacks of the disease without the epidemic influence, and the fatal cases were much more common.

Patients who suffered from pneumonia, and even those who had comparatively mild attacks of tracheitis, or bronchitis, were often left in a depressed condition, which rendered them peculiarly prone to ultimate development of tuberculosis, and preëxisting phthisis was usually greatly aggravated, and its progress accelerated by the influenza.

I think I am perfectly safe in saying that during the past year, hardly a week has elapsed that I have not seen some case of phthisis directly attributable to this disease, and serious affections of the heart have not been infrequent.

Our treatment of these cases has not been essentially different from that of inflammatory affections of the same part occurring independently of the epidemic influence. However, careful attention to the nutrition, ferruginous and bitter tonics, especially strychnia, have been demanded more imperatively than in simple inflammations, and ultimately a change of climate has been more often required.

70 State St., Chicago.

[10] Ibid, p. 428.

CURABILITY OF CONSUMPTION.

BY CHARLES W. DULLES, M.D.,

PHYSICIAN TO RUSH HOSPITAL FOR CONSUMPTION; LECTURER ON DISEASES OF THE CHEST IN THE PHILADELPHIA POLYCLINIC.

About 200 years ago (in 1672), Sir Thomas Browne, the author of that famous book, the *Religio Medici*—which every physician ought to read—wrote his almost equally famous "Letter to a Friend upon Occasion of the Death of his Intimate Friend." In this letter there is much curious and interesting writing in regard to consumption, to which disease the subject of it fell a victim. Of him Sir Thomas Browne says that he is "by this time no Puny among the mighty Nations of the Dead; for tho he left this World not very many days past, yet every hour, you know, largely addeth unto that dark Society; and considering the incessant Mortality of Mankind, you cannot conceive there dieth in the whole Earth so few as a thousand an hour."

He describes, in like quaint terms, the symptoms of consumption and the signs of approaching death, and reflects the common opinion as to its mortal character. Once only does he speak of recovery from the disease, when he says: "Monsters but seldom happen, Miracles more rarely, in Physick. Angelus Victorius gives a serious Account of a Consumptive, Hectical, Pthysical Woman, who was suddenly cured by the Intercession of Ignatius."

This view that consumption is almost necessarily fatal has prevailed in and out of the medical profession, and the idea that consumption is incurable is deeply rooted in most men's minds. Of late this idea has undergone some modifica-

tion, and careful observers believe—what experience confirms—that consumption is curable. This belief has not yet extended as far as it should for the good of our fellow-men; but it is moving on, and we may hope it will before long do more than it has done thus far to relieve the dark and despondent notions in regard to a disease which is estimated to destroy about one-ninth of the human race.

So strongly, indeed, has the current of medical opinion set toward the belief that consumption can be cured, and that the recent advances in the management and treatment of it are but the earnest of what we may before long accomplish, that there is some risk of overlooking the fact that this belief and this hope are not new on the earth, and that long ago consumption was cured, and the principles that underlie the successful treatment of the disease were plainly enunciated or shrewdly indicated.

If we make due allowance for the uncertainty sometimes caused by the fact that most ancient medical writers used the words phthisis and empyema almost interchangeably, and that their descriptions do not always clearly show that the patients actually had what we now call phthisis pulmonum, it must still appear that even Hippocrates did not look upon the disease as incurable, and that from his time until the present, the possibility of recovery from consumption was fully recognized. Hippocrates, in his wonderful book on *Prognostics* (Sydenham Translation, vol. i, sec. 17, p. 248), describes the progress of what he calls "chronic empyemata," and gives the indications of death, and also of recovery, in terms which leave little room to doubt he was speaking of consumption, or that he looked upon it as sometimes curable.

As one passes down from one to another of the older writers, the same idea can be traced, and cases of recovery may be found recorded—some of persons like Titus Pomponius Atticus, the friend of Cicero, who seems to have had warning in time of the possibilities of his long, small neck and his slender and weak body (Van Swieten's Commentaries, sec. 1198), and others like a patient of Hildanus (*Observ. Chirurg.*, Cent. III, Obs. 38), "a lady of quality" who was troubled for many years with a defluxion on her breast, and "at last spit up not only blood, but great quantities of purulent matter, and fell into a hectic, with a wasting of the body and loss of strength," who yet, Hildanus says, was cured, and bore several children, although she had never been pregnant before (Van Swieten, sec. 1198).

One of the most interesting illustrations of the curability of consumption is found in the history of Dr. Christopher Bennet, who was born in 1617 and died in 1655. He was himself affected with phthisis, and succeeded in throwing it off, whereupon some of his friends persuaded him to write a treatise on the subject. He yielded to their persuasions, and wrote his *Tabidorum Theatrum*, which was published in 1665, in London, with a preface by Martin Luellin. In this very rare book, Bennet has given much interesting and instructive matter; and it is no wonder—on the one hand—that he regarded his own disease as curable, nor—on the other—that a man capable of such shrewd observations should warn others against being deceived by false hopes. "A Physician," he says, "ought not to be deceived by the first Flatteries of a Recovery, although there seem to be a perfect Restitution; for it is most safe to continue Means sometime after a Restoration of Health, for fear of a Relapse" (Transl., London, 1720, p. 174). He himself records the case of two patients "who threw up whole pieces of their lungs, which putrefied away by a lingering phthisick." (Op. cit., p. 123.)

Van Swieten records (Commentaries, sec. 1209) a case of cure by Philip Ingrassias. The patient was a woman. "After a copious hæmoptoë, she had fallen into a consumption, and for several months afterward not only grew thin, but spit forth fetid pus. When this woman had taken decoctions of *lignum sanctum* (guaiac) for a month, she was so well recovered, that ten years after, when Ingrassias wrote the account, she was alive, and never had a relapse."

If we come down to our own times or near them, we shall find that the curability of consumption has been recognized by almost all systematic writers.

The late Prof. George B. Wood, in his "Practice of Medicine," says: "I am not one of those who believe that phthisis is in all cases necessarily fatal. On the contrary, I believe that, in one stage or another, it is occasionally cured, or at least ends in perfect recovery." He cites several cases within his own observation which justify this opinion, among them that of his preceptor and friend, Dr. Joseph Parrish, who had symptoms of phthisis when young, and in whose lungs, after his death at an advanced age, cicatrices were found, which were obviously the remains of tuberculous cavities.

Dr. G. W. Hambleton, of London, in an able pamphlet on the suppression of consumption, published this year, declares that we now have it in our power to suppress consumption. And he says there is no essential reason why this should not be accomplished. "Man," he says, "is not born to die from this disease, and, in fact, from four-fifths to six-sevenths of the race do not. We have unquestionable evidence that consumption has been completely recovered from, that a considerable reduction in its amount has been effected in some cases (for example, among prisoners), that it has been arrested for longer or shorter periods, and that persons with the signs of the disease have been able to completely es-

cape from it: consequently we must sooner or later ascertain the means by which that has been effected, and then we shall apply that knowledge to the prevention and cure of this disease."

Elsewhere in his pamphlet he says: "I have the right to express a clear and emphatic opinion on this subject; for I myself and my patients have unquestionably completely recovered from the disease. A great, a splendid, a noble victory over this disease lies in the hands of the profession. Shall we let doubt stand between us and its practical achievement?"

Those of us who have known medical men who are living witnesses to the curability of phthisis will not doubt the truth of what Dr. Hambleton says, or wonder at his earnestness in urging it upon his fellow practitioners.

More than this, we must some of us have some personal observation as to the curability of consumption, and I venture to say that there are but few medical men of much experience who could not cite cases in which the progress of this disease has been arrested, and it has been—using the expression in a just sense—cured.

If you were speaking I am sure you could report such observations, and my own convictions are founded in part on some such fortunate experiences. I have learned in practice what may be accomplished in the management of this dread disease, not only in its incipiency, but also when it had made great progress. I have to day several patients going about in apparently good health and free from cough who a few years ago were unmistakably in the beginning of phthisis. No doubt you could say as much. But, to speak of cases much more advanced when they came under my care, I would cite one of a young man with hæmorrhages and free expectoration, whom Dr. Da Costa saw in consultation, and about whom he expressed the gravest prognosis. This young man got so well in about six months that he disdained restraint, despised caution, and brought on a second attack, of which he died. Another patient, almost as plainly doomed to speedy death, seemed well, when he took to drink and died one day after a profuse hæmorrhage, unpreceded by evidences of breaking down of the lung.

Another case was that of a young man who developed with relative rapidity the signs of consumption in 1884. In April he had consolidation in the upper part of the right lung. In June he had a slight hæmorrhage. In July he had a profuse one, followed by several slighter ones at intervals of a few days. During this time he had not much cough. By October he had a profuse greenish expectoration, which was brought up with violent coughing. During the summer his cough had been a source of great annoyance to the near inhabitants of the street on which he lived, and every one of his friends and neighbors expected him to die soon. He became reduced almost to a skeleton, and in one of his hæmorrhages I was present and held a bowl into which he spit nearly a pint of blood. Notwithstanding all, he began to mend, and progressed until he had regained his usual weight, had no cough at all, ate well, slept well, and had no evidence of disease of any kind, except an insuperable laziness. In this state he lived for four years when, to complete his history, he took to drink and died, as his medical attendant, Dr. George Shoemaker, writes me, "of general breakdown from prolonged intemperance. The immediate difficulty was gastritis, some disease mitral, dilatation, poor compensation, and heart action greatly disordered. The last element caused him much physical and mental distress."

You will notice in this that there is not a word about phthisis. Experiences of this kind, I feel sure, are not peculiar to any practitioner, and the fact that I believe it is such as many other practitioners have had, encourages me to say that, as practitioners, we must not doubt that consumption is a curable disease, and we must not hesitate to encourage our patients to hope that they may be cured.

This is not the time for a discussion of the forms and stages of consumption in which the grounds for a hopeful prognosis are most or least firm. Nor can we now discuss the methods of treatment which give most promise of success. But one thing I think I may say, namely, that an early recognition of danger is usually an important condition of escape, and an early recognition of an incipient consumption is the most important step toward securing its recovery.

In closing, I would like to call attention to the fact that our country seems to be somewhat behind those of Europe in the careful and systematic study of this disease. If we are to contribute our share toward a better understanding of it, we must give more continuous study to it. A great aid to such study is found in certain large special hospitals for consumption in England and in Germany, where more or less conflicting views indeed prevail in regard to some questions of etiology and pathology, but where the most conscientious labor is devoted to investigating the principles of prophylaxis and treatment, and where great success is gained in both these directions.

In this connection I will quote Dr. Hambleton once more. He says: "It is of great importance that the consumptive patient should be placed under treatment as soon as possible, and that it be uninterruptedly continued until the recovery is complete. For this purpose we require hospitals and institutions placed in the most favorable conditions in the country and at the seaside, and I am sure the means will be gladly found for opening these institutions when once

their necessity and immense importance have been realized. With such institutions, so placed, and this system of treatment thoroughly and continuously carried out, I am certain we shall have reduced the mortality from consumption to truly insignificant proportions before the next century has escaped from its infancy."

One thing which encourages the belief that advances in the treatment of consumption and improved sanitary conditions may lead to its eventual disappearance from the world, is to be found in the fact that its ravages have been very materially lessened in the present century. Near its beginning, Dr. Thomas wrote, in his "Practice of Medicine," that the deaths in Great Britain each year were calculated at not less than 55,000 in a population of 11,000,000. This number of deaths has never been passed since then, and in 1888 it fell to 44,248, when the population of England was about 40,000,000, nearly four times as great as when Dr. Thomas wrote. This is a different experience from that of the last century, in which, as Dr. Thomas says, the mortality very considerably increased.

Dr. Flick, of Philadelphia, who has made a careful statistical study of the progress of consumption in England and Wales, has attributed the marked falling off in the death rate from this disease to the establishment and maintenance of special hospitals for the treatment of phthisis and its allied diseases. Such hospitals exist in large number (about forty) in England and Wales, and a certain number are in successful operation in Germany, while others are projected there.

There are already a number of sanitaria for consumptives in this country; but they come very far short of meeting the necessities of the people. In number they are too few, and in scope they are too limited.

The need of the moment, I believe, is a hospital for the careful and systematic study of consumption and its allied diseases—a *hospital*, not a sanitarium or a retreat, where the patients are regarded as incurable, and the duty of the physician is to gently smooth their pathway to the grave, but a hospital, where the study of the disease and of the best means to treat it shall engage the attention of a strong body of men of scientific mind and practical skill.

I am happy to be able to say to you that a hospital for consumption has been established in Philadelphia. This hospital is called the "Rush Hospital for Consumption and Allied Diseases." It has been named in honor of the great American physician who is as conspicuous in the history of medicine in this country as was Franklin in philosophy and political science. To Benjamin Rush this hospital will be, we may hope, a more enduring and more suitable monument than we could raise in brass or marble.

SOCIETY PROCEEDINGS.

American Surgical Association.

(*Concluded from page 533.*)

THURSDAY—EXECUTIVE SESSION.

The officers for the ensuing year are as follows: President, Dr. Phineas S. Conner, Cincinnati; First Vice-president, Dr. L. McLane Tiffany, Baltimore; Second Vice-President, Dr. Levi C. Lane, San Francisco, Cal.; Secretary, Dr. J. R. Weist, Richmond, Ind.; Recorder, Dr. J. Ewing Mears, Philadelphia; Treasurer, Dr. John B. Roberts, Philadelphia; Member of Council, Dr. Claudius H. Mastin, Mobile.

The committee recommended the following resolution, which was adopted:

Resolved, That the Association hereafter hold each triennial meeting at Washington, and that other annual meetings be held at such time and place as the Association may name.

It was decided to hold the next meeting in Boston, in June 1892.

The following were elected to membership: Dr. J. S. Wight, Brooklyn, N. Y.; Dr. E. W. Walker, Cincinnati, Ohio; Dr. George R. Fowler, Brooklyn, N. Y.

The following honorary members were elected: Mr. John Chiene, Edinburg; Mr. Reginald Harrison, London; Mr. Thomas Bryant, London; Mr. Arthur Edward Durham, London.

THURSDAY SESSION.

DR. FREDERICK S. DENNIS, of New York, read a paper on

RECURRENCE OF CANCER OF THE BREAST.

Only those cases were included in which a microscopical examination of the tumor has been made; the necessity of an investigation of carcinoma of the breast is shown by the fact that in England alone 7,000 deaths occur annually from carcinoma, and a large proportion of them are cancer of the breast. It has been demonstrated that cancer is a disease which is slowly increasing in civilized nations. A study of the subject shows that there are 75 per cent. of recurrences. These cases include cases of incomplete operation, *i. e.*, when axilla has not been opened. In the primary growth at the beginniug, the neoplasm is of local origin. Early and complete removal of the growth relieves the local disease, but the operation does not relieve the predisposition or susceptibilty or the capability for the recurrence of the disease. It is possible that the capability is limited to certain extent.

The recurrence of carcinoma of the breast is influenced first by the period of time from the appearance of the growth to the date of the operation. In the cases of the author in which the cure had continued for three years or more, the tumors were removed on an average six months

from the date of their first recognition in the breast. In all cases of permanent cure, the axillary glands were not invaded.

Recurrence is influenced, second, by the extent to which infiltration has taken place by any one or all of the three well recognized ways of dissemination. When the tumor has existed long enough to show extension in these directions, the growth has been of long duration.

Third, recurrence is influenced by the radical character of the operation itself. Complete removal of the breast is essential. The method of Mr. Stiles of Edinburg, by which the tumor after removal is treated with dilute nitric acid in order to show whether or not the incisions have been made in healthy structure and all the diseased structure has been removed, was described. The reported mortality of the operation is high, but in the author's 71 cases there had been but one death and that was from continued bleeding in hæmophilia.

Fourth, recurrence is influenced by the histological character of the carcinoma itself. Where the structure differs slightly from the normal the clinical history is favorable. In none of these cases was there recurrence. Where there is great departure from the normal type, the clinical history is unfavorable. The more embryonic the structure the greater the chance of recurrence.

Fifth, the recurrence is influenced by the simultaneousness in both breasts. This occurs in five per cent. of the cases. These patients are very liable to recurrence.

Sixth, recurrence is influenced by the personal factors of the individual, such as age, sex, marriage, fecundity, sterility, pregnancy, traumatism, heredity, menstruation, metastasis, mental condition, locality, etc.

Seventy-one cases of carcinoma of breast which had been operated on were referred to. In one there had been death from hæmophilia. In nearly all the axilla was opened. The operation consisted of excision of the entire breast, with all contiguous skin, the para and peri-mammary, fatty areolar tissue, the pectoral glands, the pectoral fascia and also removal of the axillary glands and fatty axillary tissue, In some cases the supra clavicular glands were removed, and in one case excision of the ribs was done. The percentage of permanent cures amounted to 30 per cent. The other held that with early and radical operation, recurrence of carcinoma of the breast will be comparatively rare.

MR. THOMAS BRYANT, London, believed firmly in the local origin of carcinoma, although we must admit that there may be a predisposition on the part of the patient to the development of the disease. The disease should be treated at an early period, and this brings us to the question of diagnosis. Many cases do not come under observation until the disease is well advanced, because the patient imagines that a disease unassociated with pain cannot be cancer. Where induration appears in a breast during the period of functional activity there may be some hesitation in the diagnosis, but in some thirty cases of this kind he had recommended immediate operation, and in all the cases, the disease was shown to be malignant. In none has recurrence taken place. When the disease has advanced somewhat further with dimpling and puckering of the skin and some immobility, we may get a good result by making a thorough operation. He had had some cases without recurrence for from five to twenty years. In the more advanced cases the surgeon should limit his operations to those in which there was a reasonable prospect of removing all the diseased structure. He does not remove the axillary glands in every case. If the glands be enlarged or the disease extend upward in that direction he removes the glands thoroughly; where the disease is quite local, and there is no evidence of axillary involvement, the axilla is not opened. In the atrophic form of cancer he thought it better not to interfere unless the tumor was giving rise to great inconvenience. Operation in these cases is often followed by a more rapid form of growth. Again in that form of cancer where the lymphatics can be traced distinctly, and the breast has a brawny feel—the lymphatic form of cancer—the surgeon does no good by interference.

SIR WILLIAM MCCORMAC, London, thought that the axilla should be opened in operations for carcinoma of the breast for two reasons, viz.: an examination of 117 cases of cancer of the breast showed that in all but two there was axillary involvement, and second, in ninety per cent. of the recurrence the disease appears in the axilla.

DR. LEWIS S. PILCHER, Brooklyn, thought that the term "recurrence" was not applicable to many of these cases, and that in many the disease was simply a continuance of the former growth. If the case goes one year without the appearance of return of the disease, it may be considered that the disease has been removed, and if it appears later, it can be regarded as a recurrent, a renewed or a new attack of cancer. In every case of cancer there is a predisposition to the disease, and we should search for some agent to counteract this constitutional predisposition which we can use in addition to operative measures. Arsenic has for many years been used for this purpose. Dr. Wight of Brooklyn has suggested the use of carbonate of lime for the same purpose.

DR. L. MCLANE TIFFANY, Baltimore, did not think that we could set any limit to the time of which recurrence might take place. He had had the disease return eight years after operation. He was a firm believer in the local origin of cancer. The date at which the disease is recog-

nized varies much. In some the disease comes before the surgeon shortly after its commencement, while in others the tumor has reached considerable size. The time at which the disease is discovered by the patient, bears no relation to the time of its commencement. Too much stress had not been laid on the necessity of thorough operation. In only two cases out of 80 operations for cancer of the breast had he found the axillary glands not enlarged. The pectoral fascia should be removed, and at times portions of the muscle should be cut away.

Dr. Kingston, Montreal, believed that cancer was essentially a local disease. If we believe this operation should be done at as early a date as possible, the glands should be removed not only from the axilla, but from its neighborhood if they are enlarged, but this should not form a necessary part of the first operation. Such a procedure adds greatly to the discomfort and to the danger. Where there is the slightest suspicion of involvement of the glands, they should be removed. If there should be recurrence the operation should be repeated as often as circumstances seem to warrant.

Dr. Joseph Ransohoff, Cincinnati, reported thirty cases of removal of the breast for cancer, without a death. He thought the danger of the operation was not materially increased by opening the axilla.

Dr. C. B. Nancrede, Ann Arbor, said with reference to the three year limit that this had been proven to exclude 98 per cent. of the recurrences. It is impossible to tell whether or not the axillary glands are involved without opening the axilla. Unless this is done the majority of the cases will be left unbenefited. He advised that the axilla be opened first and if the glands could not be removed to close the wound and not remove the breast.

Dr. J. R. Weist, Richmond, Ind., had operated fifty-five times for cancer of the breast and makes it a rule to open the axilla in every case.

Dr. George W. Gay, Boston, felt that there was no such thing as a local origin of cancer as we have the local origin of a fatty tumor. When it can be shown that a cancer taken out will not return just as a fatty tumor when removed does not return, then we can prove the local origin of carcinoma.

Dr. Edward M. Moore, Rochester, always operates in as thorough a manner as possible. He always opens the axilla and did not think that it added to the risks of the operation. He did not agree with Mr. Bryant in regard to the atrophic cases in old individuals. In these he recommended operations considering recurrence very improbable. He reported one case living seventeen years after operation, and now seventy-nine years of age.

Dr. C. B. Porter, of Boston, then read a paper on

A CASE OF DIFFUSE FIBROMA WITH A TENDENCY TO INTRACANALICULAR GROWTH OF BOTH BREASTS.

Mrs. M., æt 37 years, resident of Nova Scotia, was admitted to the Massachusetts general hospital. Has had two children, the youngest ten years old. Three years ago she discovered a hard lump in the right breast which gradually increased in size. Three months later the left breast commenced to enlarge. The breasts continued to slowly enlarge until three months ago when a rapid increase took place and the breasts soon became burdensome by their size and weight. On examination she was found to be pale, emaciated, and with ovarian pains. Right breast, largest circumference 38 inches; length from chest wall to nipple 17 inches; circumference at base 23 inches. Left breast, largest circumference 28 inches, length from chest wall to nipple 14 inches; circumference at base 23 inches. Throughout both breasts were felt movable hardened masses of irregular outline, varying in size from an orange to a closed fist. It was decided to remove the left first. The breast was transfixed at the base with two skewers and constricted below this with a tightly drawn rubber tourniquet. The breast was then removed and but little blood lost. Three weeks later the right breast was removed. Twenty days after the second operation the patient was permitted to leave the hospital to visit friends, but instead she returned to her home, requiring a long sea journey. A week later she developed erysipelas. This had much improved in four days when she suddenly aborted a five months' fœtus.

The weight of the right breast after removal was 43 pounds, and that of the left 17 pounds, a total of 60 pounds. A resumè of the reported cases was added.

Dr. J. M. Barton, of Philadelphia, reported a similar case on which he had operated, and in which one breast was involved. Adjourned Thursday.

Friday Morning.

The committee to which was referred the suggestions in the President's address offered the following resolution, which was adopted:

Resolved, That the President appoint a committee with authority to confer with the friends and admirers of Professor S. D. Gross, and with the profession at large, for the initiation of a movement on the part of the Association, having for its object the erection of a monument to Dr. Gross in the City of Washington.

As the matter is an important one, the President stated that he would announce the committee in a few days.

Dr. Lewis A. Stimson, of New York, read a paper on

TREATMENT OF FRACTURES INVOLVING THE ELBOW-JOINT.

The special interest of the subject arises from the frequency with which fractures of the lower end of the humerus are followed by more or less diminution of the function of the elbow-joint, and by deformity of the region or of the limb. The paper was devoted mainly to a consideration of the causes of these unfavorable results.

Causes of limitation of motion. Permanent stiffness after simple fracture is commonly due to change in the shape of the articular surfaces or in their relations to one another, that destroys the coincidence of the axis of curvature with that of motion; or to an overgrowth of bone upon the surface of the humerus, arresting the movement of the olecranon or coronoid process; or to more or less extensive ossification of the ligaments and capsule.

Overgrowth of bone from traumatism is more frequent in the young than in the adult. As limitation of motion may be caused by bony outgrowth from the humerus, itself the result of a persistent displacement of a fragment or of separation of the periosteum, the most efficient way to prevent it lies in an exact diagnosis and reduction of displacement, and in the avoidance of any subsequent irritation of the periosteum.

Limitation of motion from thickening of the capsule and periarticular tissues by the products of inflammation is, as a rule, a temporary condition. In the more permanent form, the lesions are more extensive, the soft tissues are torn, and a true cicatrix results. The thickened tissue may become ossified in whole or in part. This cause of limitation has been attributed, but improperly so, to prolonged immobilization, and has led to the practice of passive motion in the early stages with the object of preventing its occurrence. Observation and experiment have, however, shown that immobilization is not itself a cause of anchylosis, but that it is an efficient agent against inflammation, and that passive motion is powerless to prevent anchylosis when conditions contributory thereto are present. Passive motion, therefore, is either harmful or useless. The primary cause of the exudation and of the proliferation of connective tissue that are the anatomical obstacles to motion, is of course the original traumatism. The secondary cause is the following reaction. The only factor that can be increased or diminished by treatment is the second—that is, the inflammatory reaction. Rest is universally admitted to be the best antiphlogistic measure that can be applied to an inflamed joint. An important disadvantage of rest at once suggests itself, namely: that the torn tissues may unite with shortening. Both clinical observation and theoretical considerations indicate that passive motion in the early stage does not avoid this disadvantage, but actually increases it. In the present state of our knowledge, it seems that a certain amount of limitation is unavoidable. Massage, however, hastens the absorption of exudation and the restoration of mobility, as does also permanent elevation or suspension of the limb. Reunion with shortening may be opposed by change in the attitude of the limb every few days. At a later period passive motion has its value, but in the early stages it is to be avoided.

In regard to deformity, reference was made to only one, that commonly known as the "gun stock" deformity, due to unreduced displacement of the internal or external condyle. In order to avoid this deformity, the displacement should be reduced by pressure upon the fragment or by abduction of the extended forearm until its outward deviation is equal to that of its fellow, and immobilization by dressings that will not reproduce the displacement.

Treatment.—The first element in the treatment is the reduction of the displacement. If necessary, an anæsthetic should be employed. In supra-condyloid fractures, permanent traction is usually necessary to overcome the displacing action of the flexors and extensors. This can be effected by vertical suspension of the limb, the patient being kept in bed, or by a weight suspended from the upper part of the flexed forearm while the patient is erect. The former method was recommended for the first fortnight of treatment, especially in compound fractures. Suspension is made by strips of adhesive plaster placed along the front and back of the forearm, and attached to the support of India rubber cords, or a weight and pulley. In simple fractures, the other method may be employed. The limb is encased in plaster of Paris with the elbow at a right angle, the wrist being placed in a sling, and a weight not exceeding 5 lbs. suspended from the elbow.

In inter-condyloid fractures with marked separation, there is no practicable means of surely maintaining reduction, and considerable limitation is to be expected. In these cases, a broad, heavy posterior splint, covering about two-thirds of the circumference of the limb, the elbow being at a right angle, was recommended.

In fracture of either condyle, the treatment is by a posterior rectangular splint, either metal or plaster. The forearm has been supported across the chest by a sling at the wrist. In some cases treatment in full extension has been employed. After this method has been employed for the first ten days or fortnight, recourse is had to the position with the elbow at a right angle.

Gentle massage will hasten convalescence. It may be advisable to change the position of the limb during treatment, and if great limitation is to be expected, that attitude should be given to the joint in which, if stiff, the usefulness of the limb will be greatest. In supra-condyloid and

intra-condyloid fractures, the splint should be worn six weeks, and in fractures of the condyles, for about four weeks. After removal of the splint, the arm should for a few days be supported in a sling. If necessary, passive motion may at this time be resorted to to increase the range of motion.

Dr. N. P. Dandridge, of Cincinnati, agreed with what had been said by the reader of the paper, and referred to two cases occurring under his observation. In one case of simple fracture from great violence in which non union had occurred, the arm was treated in a position of almost complete extension. The second case was one in which after fracture at the elbow joint a projection of bone pressed upon the median nerve, causing severe pain and atrophy of the muscles in the distribution of the nerve. The case was seen three months after the accident. Removal of the bone was followed by relief of the pain and a gradual restoration of the function of the muscles.

Dr. R. A. Kinloch, of Charleston, thought that in simple fractures about the elbow, if seen early and the ordinary principles in regard to the treatment of fractures be applied, the result would be good. Probably in a large number of cases we must expect some restriction of movement. The most important element in the treatment is the proper reduction of the fragments. This should be done at once, an anæsthetic being employed if necessary. The proper reduction of the fragments is determined by testing the functions of the joint. The second indication is to retain the fragments in the proper position. If the case is treated with intelligence, it makes little difference what way the splint is applied, or whether it is treated in flexion. The position is to be determined largely by the peculiarities of the individual case. He was himself inclined to favor the extended position.

In regard to passive motion used early, he thought that it did more harm than good. If the parts have been properly reduced and held in position, and there is a danger of subsequent trouble, passive motion may begin in three or four weeks.

Dr. E. M. Moore, Rochester: In a fracture of the internal condyle the cause of the displacement is the flexor muscles, and to relax these muscles the arm is to be placed in the flexed position. In fractures of the external condyle he had also found this position the preferable one, for when the forearm is flexed the dense fascia on the front of the arm is rendered tense and acts as an efficient splint. He objected to the extended position entirely. He treats all fractures about the elbow joint, with the exception of fractures of the olecranon, in the rectangular position for the first ten days or two weeks. Lateral splints are used with the object of pressing the fragments together. After the tenth day the fracture is dressed every other day, the angle of the splint being changed a little each time, so that the arm passes from almost complete flexion to almost complete extension. He had never had the slightest difficulty in any case since adopting this mode of treatment.

Dr. James M. Cann, Pittsburg, said that it was not always easy to determine the exact nature of these fractures about the elbow joint, even with the patient under the influence of an anæsthetic. While the patient is under the anæsthetic the preliminary dressing should be applied. He recommended the use of the internal angular splint, preferably that suggested by Dr. Packard. He did not favor the use of passive motion at an early stage. Passive motion should not be resorted to prior to the twentieth day.

Dr. John B. Roberts, Philadelphia, thought that the teaching advocated by some of the speakers was to a large extent dangerous and incorrect. That is, that injuries about the elbow joint should be treated in the flexed position. He believed that, except in unusual cases, these fractures should be treated in the extended position, according to the doctrine advocated by Dr. Allis. In this way the gun-stock deformity is avoided. He now approached fractures of the elbow with the same certainty of getting a good result as he did fractures of the lower end of the radius.

Dr. S. H. Weeks, Portland, dwelt upon the fact that all authorities, with few exceptions, advised the flexed position in the treatment of fractures about the elbow joint. Until there was more positive evidence of the value of the extended position he thought it better to continue to treat these fractures in the flexed position. He employed passive motion in a modified way. After two weeks' treatment the splints are removed and the joint moved gently but not sufficiently to cause pain. This simply alters the relations of the parts without doing any damage.

Dr. L. McLane Tiffany, Baltimore, thought that as good results were reported from various dissimilar methods of treatment, we must conclude that the prognosis of elbow injuries depended more upon the patient than upon the surgeon. Fracture of the elbow is rare in adults and common in children, and in children, with reasonably good treatment, there should be a good result, and by the time adult age was reached the motion would be almost perfect. In the adult the prognosis is more grave. He had had good results both with the flexed and with the extended position. In compound fractures, the secret lies in the relief of tension, irrespective of the apparatus employed. Incision up and down the arm through the strong fascia should be made as freely as may be required.

ALBERT VANDERVEER, M.D., of Albany, read a paper on

RETRO-PERITONEAL TUMORS, THEIR ANATOMICAL RELATIONS, PATHOLOGY, DIAGNOSIS AND TREATMENT, WITH REPORT OF CASES.

As our experience in abdominal surgery increases we find that there are yet many problems that confront us, and of these problems there are none which requires more careful research and is capable of greater improvement both in operative management and in prognosis, than new growths arising from the retroperitoneal space. In order to bring this subject more fully to the attention of the association, the following cases are reported:

Case 1.—Miss S., æt. forty-two years, consulted the author in March, 1882, on account of a tumor located in the back. This was first noticed fifteen years previously. Examination showed a large tumor attached to the right side of the spine at the level of the first lumbar vertebra. It seemed attached to surrounding tissues of a smooth contour and hard to the touch. Operation was advised but declined. The tumor continued to increase in size until November, 1888, when she died from other causes. The autopsy showed the origin of the growth to be the connective tissue about the right kidney. It was encapsulated and could have been easily removed. It weighed eight pounds. The microscope revealed the presence of fat and myxomatous tissue with an abundant small round cell infiltration.

Case 2.—Mr. V., æt. 41 years, married, was first seen May 28th, 1889. Five years ago strained his back. The pain following this has not been relieved by any treatment. Three months ago he became worse, the abdomen began to enlarge. The pain was more severe. He lost appetite and flesh. The ankles became œdematous and a distressing cough developed. The urine was scanty and high colored, but free from albumen and casts. The abdomen was more prominent on the right side. Fluctuation could not be elicited but palpation gave an impression similar to that of a lipomatous tumor. On the right side there was flatness from the nipple to the crest of the ileum with the exception of a narrow space along the border of the ribs where there was a zone of resonance. The probability of the growth arising from the kidney was strong and an exploratory abdominal section advised.

This was done June 1, 1889, an incision five inches long being made over the external border of the right rectus muscle. The growth was reached and the capsule divided, but from its attachments it seemed futile to attempt its removal. The patient recovered from the operation and for a considerable period was relieved of pains. The growth continued to increase in size and the patient died October 21, 1889.

The tumor, which weighed fifty-six pounds, originated behind the peritoneum and was attached to the right kidney. The microscope showed it to be an adipose tumor presenting a condition of myxo-sarcoma with sarcomatous infiltration.

Case 3.—Mr. N., æt. thirty-nine, a brass worker by occupation, began to have vague abdominal symptoms late in the year 1888 with failure of flesh and strength. In June, 1889, he developed jaundice and a tumor was found in the left hypochondriac region and lumbar region. This was as large as a child's head. An exploratory operation was advised, but refused. It was believed that the growth was connected with the left kidney. The tumor continued to grow and in November, 1889, the patient died. The tumor was found to have sprung from the region of the left suprarenal capsule and involved it. It also surrounded the kidney. It weighed six and one-eighth pounds. The microscope showed an appearance similar to that in case two, but with a greater preponderance of sarcomatous and myxomatous elements.

A careful study of the reported cases and of the literature of the subject impresses one with the belief that the most frequent origin of these growths is in the connective tissue of the capsule of the kidney, and that the next most frequent seat is the supra-renal capsule. None of these tumors can be said to be absolutely benign, even those which are made up entirely of histological elements, such as lipoma fibroma, or myoma. While they show no great tendency to recurrence after complete removal, yet from the great size to which they develop and their tendency to undergo degenerative changes, they cannot be classed as innocent growths.

In many of the reported cases the origin is not stated, and indeed it would, from the subsequent changes in anatomical relations, seem quite impossible to determine the exact origin of many of the large retro-peritoneal growths. They almost always present themselves in the line of least resistance, that is anteriorly. A careful study of these tumors shows them to be of a mixed variety, containing both the elements of the lipoma and myxoma tissues which are histologically very closely associated. Fat is developed from embryonal mucin and in post-fœtal life occupies those spaces in the economy which later in the fœtus is of myxomatous elements. Doubtless many of these growths arise under suitable conditions. From congenital neoplasms these growths often become cystic and reach immense proportions. They often present a numerous round celled infiltration pointing to a sarcomatous element. Sarcoma, either in its typical form or in combination with other tissues, often occurs.

Diagnosis.—There is not a single symptom

that is pathogenic and the diagnosis is more dependent upon the process of exclusion. Tumors of the other abdominal and pelvic organs, as well as aneurisms and tumors of the abdominal wall, must be excluded. As already stated many of these tumors have their origin in the capsule of the kidney or the connective tissue surrounding it. These present, in their earlier stages at least, physical signs differing in no respect from tumors of the nephritic parenchyma. In none of the cases reported has renal hæmorrhage or albuminuria, with or without casts, occurred, conditions which are the rule with tumors of the parenchyma of the kidney. A valuable adjunct in the diagnosis consists in noting the relation of the tumor to the intestinal tube as shown by the insufflation of hydrogen gas.

Prognosis. — Without operative interference there is but one termination. The rapidity with which the fatal result is reached varies with the character of the growth. The mean duration of life after the discovery of tumor is about nine months. Operative treatment offers much promise; the immediate mortality of the operation is great, yet from the hopelessness of the condition it is to be urged with great earnestness.

In operations for the removal of retro-peritoneal growths, the choice of incision will usually fall in the line of the linea semilunaris. By the separation of the peritoneum from the internal border of the tumor, it may be attached to the internal border of the abdominal wound, making the whole field of operation extra-peritoneal, the incision of the posterior fold of the peritoneum should be external to the attachment of the mesentery of the colon, although not absolutely necessary. In the removal of the growth by enucleation, care should be taken to determine the source of the blood supply and the relation of the great vessels. There are likely to be large thin-walled veins deep in the wound, requiring ligature. At times it will be found necessary to remove the kidney with the tumor. As in all abdominal work the operator should be prepared for any and every complication. After enucleation the cavity must be thoroughly drained. The after treatment is the same as in all other severe abdominal sections.

Like all other conditions in surgery, there is certainly a better understanding of these cases going on. A more correct and early diagnosis, as is the case in all that pertains to medicine and surgery, will surely bring a larger percentage of recoveries.

These are purely surgical cases. No medicines, no mineral waters or baths, electricity or other lines of therapeutics, having as yet been of any service. To the paper was appended a complete bibliography of retro-peritoneal new growths.

DeForest Willard, M.D., of Philadelphia, read a paper on

INTRA-THORACIC SURGERY. BRONCHOTOMY THROUGH THE CHEST WALLS FOR FOREIGN BODIES IMPACTED IN THE BRONCHUS.

Dr. Willard gave the results of a number of experiments on dogs, in which an opening was made in the chest walls, one or more ribs excised, and the bronchus thus reached, either anteriorly or posteriorly. The operations were all fatal.

The following conclusions were presented:

1. In dogs, the bronchus can be reached either anteriorly or posteriorly through the chest walls, but the anatomical position is in such close proximity to large and important structures, that safe incision is a matter of extreme difficulty and danger.

2. Bronchotomy through the walls of the thorax is an operation attended with great shock from collapse of the lungs, and until the technique is farther advanced, is liable to result in immediate death.

3. Collapse of the lung is more serious in a healthy organ than in one physically crippled by disease.

4. The serious inherent difficulties are shock, suffocation from lung collapse, enormous risks of hæmorrhage from pulmonary vessels, injury of or interference with the pneumogastric nerve, great and fatal delays, owing to the exaggerated movement of the root of the lung caused by the excessive dyspnœa.

5. Closure of the bronchial slit is slow and dangerous. To leave it open causes increasing pneumothorax, by its valve action, and also permits the entrance of septic air into the pleural cavity.

6. Although a foreign body can be reached by this route, yet removal is hazardous. To secure a subsequent complete cure seems, in the present state of knowledge, very problematical.

7. When the presence of a foreign body in the bronchus is definitely determined, and primary voluntary expulsion has not been accomplished, there is great danger in permitting it to remain, even though it may but partially obstruct the tube. The risks both of immediate and of subsequent inflammation are serious.

8. Low tracheotomy is then advisable when the presence of a foreign body is certain. It adds but little to the risks, and affords easier escape for the object, even when extraction is not feasible.

9. *Subsequent dangers arise from severe and prolonged instrumentation; not from tracheotomy.*

10. Voluntary expulsion is more probable after than before tracheotomy.

11. Tracheotomy is permissible even after an object has been long in position, unless serious lung changes have resulted.

12. The question of tracheotomy will depend

largely upon the form, size and character of the foreign body.

13. The term bronchotomy should be limited to an opening of the bronchus, and should not be employed to designate higher operations.

14. The risks from thoracotomy and bronchotomy following unsuccessful tracheotomy are much greater than the dangers incurred by permitting the foreign body to remain.

DR. J. R. WEIST, of Richmond, said that from a study of one thousand cases in which a foreign body was impacted into a bronchus, he had reached the conclusion that the chances of the patient were better if left alone than if an operation of what was formerly called bronchotomy was done.

DR. S. H. WEEKS, of Portland, thought that in these cases tracheotomy should be performed, as this affords a chance of reaching the foreign body, and also offers a chance for the spontaneous expulsion of the body. It occasionally happens that the body is forced up against the vocal cords and then falls back, or else suffocates the patient before relief could be afforded. He reported the case of a child of ten years, who had so gotten into the trachea a screw cap that was used to close a pocket flask. It had been there several days before the patient came under observation. It was decided to open the trachea. This was done, and the patient suspended, but the foreign body did not escape. The patient was then placed in the horizontal position and the attempt made to remove the cap with forceps. It could be felt, but not grasped. After working unsuccessfully for some time, the patient was again suspended and the attempt with the forceps renewed, and at once the body was grasped and removed. The patient made a perfect recovery.

DR. KINGSTOWN, of Montreal, reported a case in which he had removed an artificial incisor tooth with its attachments from the trachea where it had remained for three months. The operation necessitated prolonged manipulation but was followed by no bad results.

DR. HOWARD MARSH, England, thought that on account of the danger of leaving the foreign body in the bronchus, the uncertainty in regard to the possibility of removal until the attempt is made, and the safety of tracheotomy, the operation should be performed. The operation should be performed in all these cases as it gives the patient a chance where otherwise he perhaps has none.

MR. ARTHUR EDWARD DURHAM, of London, agreed with the author of the paper that the operation through the chest wall was a dangerous and doubtful procedure. The more he saw of these cases the more satisfied was he that the proper thing to do where there is clear evidence that a foreign body is impacted in the bronchus, is to open the trachea low down and endeavor to remove the foreign body or to facilitate its spontaneous expulsion. This opinion was the result of considerable experience.

DR. LEWIS A. STIMSON read a paper on

OLD UNREDUCED DISLOCATIONS OF THE ELBOW.

The following papers were read by title:

"Fractures Involving the Upper Third of the Femur Exclusive of the Neck," by DR. O. H. ALLIS, Philadelphia.

"Fractures of the Bones Which Form the Elbow Joint, and their Treatment," by DR. LEVI C. LANE, San Francisco.

"Hemiplegia with Aphasia, Following Ligature of the Common Carotid Artery," by DR. J. EWING MEARS, Philadelphia.

"Investigation of Pistol-shot Wounds of the Skull and their Treatment," by DR. E. H. BRADFORD, Boston.

"The Results of Experiments in the Filling of Cavities of Bones Following Operations for Caries," by DR. E. H. BRADFORD, Boston.

After extending a vote of thanks to the retiring President, the Association adjourned to meet in Boston, Mass., in June 1892.

BOOK REVIEWS.

HEALTH REPORTS.—1. *Eleventh Annual Report of the State Board of Health of New York.* Vols. I and II. Paper. Pp. 935. Octavo. Albany: Jas. B. Lyon. 2. *Thirteenth Report of the State Board of Health of Wisconsin.* Paper. Pp. 150. Octavo. Madison: Democrat Printing Company.

Twenty years have elapsed since the creation of the first State Board of Health in the United States, in Massachusetts, and from that single beginning, State after State has fallen into line, until nearly every State in the Union has its board of health in more or less active operation, according to the appropriations granted them by the various legislatures.

The reports show careful and conscientious work, in furnishing information to municipalities within their boundaries, and the New York report is especially valuable on account of the complete directions given for the sewerage of certain villages and the disposal of the sewage, and rules and regulations for the water supplies of certain others. The treatment of these topics may well serve as a model for similar work elsewhere.

The Wisconsin Board was hampered in the publication of its report by the parsimony of its legislature. The board reprints in its report, with favorable comment, the resolution of the conference of State boards on the subject of the great destruction of forests now going on, and the means of prevention of the deforestation. This subject is one of growing importance, not only from the standpoint of the sanitarian, but as well from that of the publicist. The general encouragement of tree-planting and the laying out of public parks is needed in every State in the Union.

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SATURDAY, OCTOBER 10, 1891.

TOXICITY OF THE URINE—ITS DETERMINATION AND CLINICAL IMPORTANCE.

Speaking generally, acute febrile processes in the present state of our knowledge, may be divided into two classes, those in which the febrile reaction, with its accompanying nervous manifestations, particularly brain symptoms, is due to the presence in the body fluids of soluble poisons, intoxication; and, secondly, those cases in which the febrile reaction or nervous manifestations are due to, or at least are accompanied by, distinct structural changes. How far the second class of cases may be hereafter shown to belong to the first class it is not our present purpose to discuss. Perhaps it would be better to present the same classification in different terms, and say that there are acute cases in which the symptoms may be made to disappear, promptly and completely, by active eliminative measures, and, secondly, cases in which elimination fails to relieve.

In practice it is difficult and often impossible to differentiate the two classes, and resort to therapeutic measures must be had to determine the diagnosis, measures which, it is needless to say, are highly unscientific so far as diagnosis is concerned, and while often satisfactory, by no means always so.

In the first or toxic class the poisons producing the symptoms will be wholly or in part eliminated by the urine, and examination of this fluid ought to determine the diagnosis at once. And so it would if it were possible to make the examination. But many of the poisons producing the most intense symptoms act in quantities so small as to defy chemical detection in the urine. Again, these poisons are exceedingly numerous, and many of them as yet unknown, and to examine the urine for even the known ones would be a work scarcely possible, even to the trained chemist, with properly equipped laboratory and abundance of time. Moreover, the qualitative recognition of the poisons is not enough, some idea must be had as to their quantities. What is needed, then, is some general reagent by means of which may be quickly determined, first, that the urine is toxic; second, the degree of toxicity; third, the kind of toxicity.

With the present equipment this reagent is not to be found in the chemical laboratory, but is to be sought in the biological laboratory. The reagent which answers the requirements is the animal organism.

SEMMOLA, following the suggestion originally made by BOUCHARD, has recently made some interesting observations in this direction, and in the *British Medical Journal* of Sept. 19, 1891, reports two cases which illustrate singularly well the clinical importance of such studies. The first case was that of a phlegmon in the right arm of a man aged 70, with serious general and especially cerebral symptoms. Some of this patient's urine was injected into a rabbit with the effect of reproducing the toxic symptoms in a more serious form than in the human patient. This demonstrated the toxic character of the attack and enabled him by way of prognosis to foretell that improvement would take place when the uro-toxic coëfficient of the urine was diminished, in spite of the fact that, owing to an intercurrent attack of diarrhœa, the patient's general condition seemed to be worse, and when the clinical prognosis was therefore doubtful. By way of treatment he ordered copious draughts of sulphuric lemonade with the object of destroying the circulating ptomaines, and favoring their elimination.

"In the second case—one of fibrinous pneumonia following influenza—whilst the specific inflammatory process successively invaded new zones of pulmonary tissue, there supervened,

suddenly, eclampsia and tetanoid symptoms, which made the medical attendant suspect the onset of infective cerebro-spinal meningitis. The condition of the patient was most serious; a temperature of 40.07° C. (104° F.) pulse 125, respiration 55; fluid yellowish green expectoration, profuse sweating, etc., in short the classic picture of a most violent acute infection. . . . . I did not however feel justified in accepting without much reserve the diagnosis of cerebro-spinal meningitis, and before giving my opinion I caused experiments to be made in the laboratory of my Clinical institute, on the biological analysis of the urine which the patient had passed in the last twelve hours. . . . . The injection of 5 c. c. of the urine into a guinea-pig weighing 250 grams, and 10 c. c. into a rabbit weighing 1,050 grams, was immediately followed by general tremors, alternating with tonic convulsions and extreme dyspnœa, exactly resembling the clinical symptoms and convulsions seen in the patient, and clearly showing that part of the dyspnœa, the severity of which was certainly disproportionate to the extent of the pneumonic process, was of bulbo-paralytic origin. I no longer hesitated as to the diagnosis, but declared that the convulsions did not indicate an attack of cerebro-spinal meningitis, but simply a most acute intoxication, due to the formation of new special ptomaines in that great and mysterious biochemical laboratory of which the human organism, when attacked by influenza, is the seat." A more favorable prognosis was made and the patient put on large doses of sodium iodide as a means of elimination. Within twenty-four hours the convulsive attacks ceased, and the urine passed after their subsidence, although the pneumonic process continued with hardly any appreciable improvement, and the temperature persisted at 104° F., showed itself on biological analysis to be inoffensive. In fact the injection of 90 c. c. into a rabbit did not induce the slightest toxic manifestation referrable to the classic clinical type shown by the patient.

MISCELLANY.

AMERICAN PUBLIC HEALTH ASSOCIATION.—The nineteenth annual meeting will be held at Kansas City, October 20 to 24, 1891. The Local Committee of Arrangements announces that all the Railway Passenger Associations of the country have granted a one and one-third fare rate for the round trip, on the usual certificate plan, that is: 1. Procure a certificate of attendance from the agent at the starting point by paying full fare to Kansas City. 2. Have the certificate of attendance signed by the proper officer of the Association at Kansas City. This certificate will then procure return ticket for one-third fare. All the leading hotels of Kansas City will give special rates to delegates. Arrangements are being perfected for an excursion into Kansas, as one of the features of the entertainment of the Association. For any information as to the meeting, address Dr. E. R. Lewis, Chairman, or Dr. Joseph Sharp, Secretary, Local Committee of Arrangements, Kansas City, Mo.

THE MISSISSIPPI VALLEY MEDICAL ASSOCIATION meets next Wednesday morning at the Pickwick Theatre, in St. Louis. The indications are that the meeting will be very much the largest ever held by this banner organization.

DISTRICT MEDICAL SOCIETY OF CENTRAL ILLINOIS.—The Semi-Annual Meeting of this Society will be held in Vandalia, Ill., on Tuesday, October 27, 1891.

Officers.—President, G. W. Fringer, M.D., Pana; First Vice-President, W. G. Wilson, M.D., Shelbyville; Second Vice-President, Wm. H. Sparling, Moawequa; Secretary, J. H. Miller, M.D., Chicago; Treasurer, F. B. Haller, M.D., Vandalia.

Board of Censors.—W. J. Eddy, M.D., Shelbyville; J. Huber, M.D., Pana; W. W. Murfin, M.D., Patoka; Jno. A. Prince, M.D., Springfield; Amos Sawyer, M.D., Hillsboro.

PROGRAMME.

Tuberculosis, W. J. Eddy, M.D., Shelbyville.

Movable Kidney and Hydronephrosis, David W. Graham, M.D., Chicago.

Acute Periostitis of the Femur, Wm. Barnes, M.D., Decatur.

Report of a Case in Gynæcology, Naomi Pierce Collins, M.D., Decatur.

Dermoid Cysts of the Ovary, with Report of Cases, Louis A. Malone, M.D., Jacksonville.

A proposition to amend certain parts of the Constitution and By-Laws will be submitted at this meeting. You are earnestly requested to be present.

J. H. Miller, M.D., Secy, 113 Adams St., Chicago.
G. W. Fringer, M.D., Pres., Pana, Ill.

Official List of Changes in the Stations and Duties of Officers Serving in the Medical Department, U. S. Army, from September 26, 1891, to October 2, 1891.

Capt. Walter Reed, Asst. Surgeon U. S. A., relieved from duty as attending surgeon and examiner of recruits at Baltimore, Md., and ordered to Ft. Snelling, Minn., upon completion of his duties as member Army Medical Board.

Asst. Surgeon Charles B. Ewing, U. S. A., will continue on duty as attending surgeon and examiner of recruits at St. Louis, Mo.

Asst. Surgeon William D. Crosby, U. S. A., relieved from duty at Ft. Pembina, N. D., and ordered to Ft. Missoula, Mont., for duty.

Surgeon James P. Kimball, U. S. A., relieved from duty at Ft. Supply, I. Ter., and ordered to Ft. Clark, Tex.

Surgeon Julius Patzki, U. S. A., relieved from duty at Ft. Huachuca, A. T., on expiration of present sick leave, and ordered to Ft. Supply, I. Ter.

Official List of Changes in the Medical Corps of the U. S. Navy, for the Week Ending October 1, 1891.

Medical Director Thos. J. Turner, placed on the Retired List September 21, 1891.

Surgeon Jno. H. Hall, placed on the Retired List September 25, 1891.

Surgeon Jno. C. Boyd, ordered to duty on Naval Medical Examining Board.